June 21, 1948

STEEL

The Magazine of Metalworking and Metalproducing

ESTABLISHED 1882

EDITORIAL INDEX, PAGE 55

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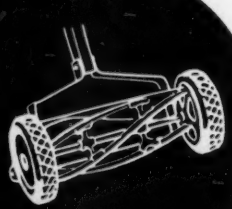

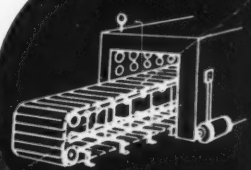

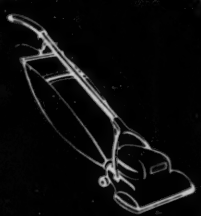

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STEEL

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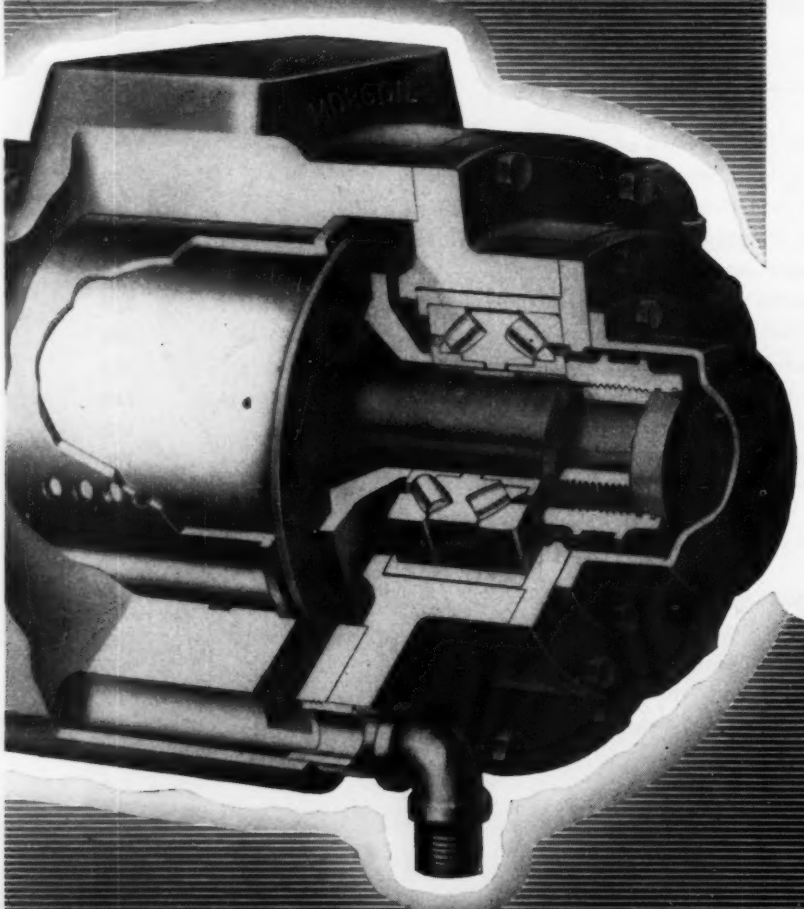
You can roll it THICK with MORGOILS



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June 21, 1948

Steady Production

Several months ago Richard R. Deupree, president of Procter & Gamble Co., spoke to the American Newspaper Publishers Association on "Management's Responsibility Toward Economic Stability." His remarks were based upon the performance of the Procter and Gamble "guaranteed employment plan."

In 1923 the company discovered that while its soap products were consumed fairly evenly throughout the year, they were not purchased evenly nor were they manufactured steadily. The company decided that goods that are consumed evenly could be produced evenly. It smoothed its production curve and guaranteed 48 weeks' work in the calendar year to employees who had been with the company two years or longer. Since 1923 no employee eligible under the plan has been laid off because of lack of work.

A plan that has worked so well has many obvious advantages. However, Mr. Deupree mentioned one that is not too obvious and is of timely importance. Today P & G is running its plants at 90 per cent of capacity or better because of uniform production. If the plants were operating according to normal trends, they would be limping along at 50 to 60 per cent at times, which would automatically force them to spurt at 130 to 140 per cent later to catch up. This would require 30 to 40 per cent additional capacity, costing $100 million. Steady operations are saving the company this substantial investment.

Unfortunately the problem of leveling production peaks and valleys in the metalworking industries is not as simple as it was for P & G in soap. Producers of rolled steel, castings and forgings are largely at the mercy of processors, fabricators and manufacturers. Notwithstanding this, no segment of industry is under heavier pressure to increase existing capacity than are these basic producers.

This situation suggests the need of new studies of consuming and buying habits in the metalworking industries with a view of smoothing the production curve. Definite progress has been made at times in the past in getting away from seasonal or sporadic ordering and shipping of steel. Intelligent research by sales managers might reveal new opportunities for spreading orders more evenly when normal market conditions again prevail. Anything that can be done in this direction will reduce the capacity required to meet the nation's requirements.

* * *

"GREEN BOOK" CHANGES: Among topics discussed at the annual meeting of Machinery & Allied Products Institute at Washington was that of the costs incurred by manufacturers in executing government contracts which will be honored by the government. The famous "green book", which designates "allowable" costs, now is in process of revision.

In its present state, the book provides that the following items are subject to disallowance in whole or in part: 1. All general selling expenses other than those chargeable to the particular contract, with selling commissions disallowed entirely. 2. Royalty payments to an officer or anyone else having a substantial interest in the contractor's business. 3. Advertising. 4. Contributions to local and other welfare funds. 5. Collection expenses.

It is easy to understand why the joint service committee, which is rewriting the "green book", is questioning these expense items, at least tentatively. The reason is that experience with government contracts during World War II

(OVER)

brought out cases of unwarranted expenditures under each of these five costs.

However, the fact that there were some abuses does not justify a policy that will disallow all costs under these headings in the future. There are numerous circumstances wherein general selling expense, commissions, royalties, advertising, contributions and collection expense are legitimate costs in the execution of a government contract.

The text of the "green book" should be elastic enough, the arbitrary powers given to inspectors should be sufficiently curbed and the discretionary authority granted the government officials who review cases for final decision should be broad enough to enable an honest contractor to receive credit for legitimate expenses incurred in good faith. —p. 73

* * *

TRACING 1947 STEEL: In a period when demand exceeds supply by a wide margin, steel consumers are prone to ask, "Who is getting the tonnage?" The answer is found in the American Iron & Steel Institute's annual report on the distribution of finished steel products for 1947.

The official figures show no major deviations from the normal peacetime pattern of steel consumption. The automotive industry, exclusive of tractors, led all other direct consumers with 8,846,419 tons, or 14.03 per cent of the total. Other leading consumers in order of tonnage were construction and maintenance, containers, rail transportation, exports and machinery and industrial equipment. —p. 63

* * *

TROUBLE IN BIZONIA: Anglo-American-German Steel Commission, which was set up to study methods for increasing steel production in Bizonia, has been dissolved because of political differences.

The dispute centers around Dr. Herman Reusch Jr., a German representative on the commission. He is the leading German exponent of free enterprise and is liked and trusted by many Americans now in Germany. On the other hand, British and German trade unionists rate him as a "war-mongering heavy industrialist, subservient to the Nazis" and they have protested his presence on the commission.

Rather than dismiss Dr. Reusch outright and thereby be forced to nominate a successor who would be acceptable to the socialistic-minded trade unionists, the Allied commanders dissolved the commission. The incident reflects the wide gulf between the British and German socialists, who favor a planned economy, and the Americans who seek as much freedom for enterprise as may be possible. —p. 74

* * *

WANT NO PART OF NRA: Walter B. Wooden, associate general counsel of the Federal Trade Commission, told members of the American Marketing Association that adoption of legislation that would legalize basing point or other pricing which has been held illegal by the Supreme Court would be a retreat to the philosophy of the National Industrial Recovery Act.

This statement confirms the belief that FTC spokesmen misunderstand the motives of industrialists who have suggested that it may be desirable for Congress to step into the pricing picture. Few responsible leaders in industry want price fixing or any part of NRA. What a majority in industry wants is protection from "about-face" interpretations of antitrust laws which would force industry to revise its practices so violently that the nation's economy might be affected seriously. Surely there must be legal pricing methods that would not inflict chaos upon the country. —p. 68

* * *

OLD FRIEND RETIRING: Prophecies that the days of the traditional steam locomotive are numbered, heard with increasing frequency in recent years, are given additional weight by two current incidents.

At the summer meeting of the Society of Automotive Engineers at French Lick, Ind., J. W. Barriger of the Chicago, Indianapolis & Louisville Railway predicted that American railroads will be largely dieselized by 1955 and that steam motive power will fade gradually from the rail transportation picture. Concurrently, American Locomotive Co. announced it is ending production of steam locomotives and will concentrate on diesel-electric units.

The iron horse has been a most popular American institution. Millions of people will find it difficult to believe that it is due for early retirement after serving the nation's railroads faithfully for 117 years. It is doubtful whether the diesel, with all of its advantages, can win from the man in the street the sentimental attachment he bestowed upon its steam-powered predecessor. —p. 67

E. L. Shaner

EDITOR-IN-CHIEF

News Summary

LABOR WINS THIRD ROUND—Efforts of the large steel and electrical companies to stem the tide of inflation by denying third round wage increases while reducing the prices of their products appear doomed to failure. Automotive, electrical, aircraft and rubber companies are following the wage pattern established in the Chrysler settlement and granting flat wage increases in the neighborhood of 11 to 13 cents an hour (p. 69). General Motors settlement gearing future wage rates to the cost-of-living index is not being followed by other companies. As expected, the new round of wage increases is causing a new round of price increases.

WHO GETS THE STEEL—Automotive industry last year maintained its peacetime position as the leading steel consumer; more than 9 million tons, including processed forgings, went to auto and parts makers, a record tonnage (p. 63). Construction was second largest consumer with containers and rail transportation following. Although automakers received more steel than ever before, U. S. car and truck production in 1947 was lower than in three previous years, reflecting the high production of replacement parts, the large number of trucks produced and the larger steel consumption per postwar car (p. 77).

EXPANSION—The long controversy over large-scale steel expansion was stirred up again last week by a report issued by Senator Murray of Montana who asks that capacity be enlarged to 105 million tons annually (p. 70). The senator suggests the government should aid in financing the new facilities. Industry men point out that construction costs now are abnormally high, that building of new capacity would drain urgently needed steel from consumers during the height of the shortage and that adequate raw materials to support an enlarged capacity are lacking.

ALLOCATIONS—Spokesmen for foundries protested plans to allocate 110,000 to 128,000 tons of pig iron monthly for the residential housing program (p. 66) in hearings before the Office of Industry Cooperation.

PRICING—Legislation to legalize basing point or other pricing systems outlawed by the Supreme Court would be a retreat to the philosophy of the NIRA, according to FTC Counsel Walter B. Wooden. He sees no practical way in which status quo of identical delivered price systems can be preserved (p. 68).

PASSING OF STEAM—Days of the steam locomotives are numbered. American Locomotive Co. is closing down its steam department for lack of orders and at the same time is increasing output of diesel-electrics (p. 67). Transportation engineers predict most roads will be largely dieselized by 1955.

PREPAREDNESS—Industrial preparedness is improving this country's chances for peace, Thomas J. Hargrave, Munitions Board chairman, assured the Machinery & Allied Products Institute members (p. 73) in outlining what has been and is being done to strengthen our defenses. Meanwhile industrialists are watching the rewriting of the "green book," which designates allowable costs on government contracts, with interest.

SIGNS OF THE TIMES—Former officials of Empire Steel Corp. have leased the naval reserve steel plant at Birdsboro, Pa., and expect to start production of ingots within 30 days (p. 65) under the name of Penn-Ohio Steel Corp. . . . Contract for a 668-foot, 20,000-ton ore carrier has been awarded (p. 69) American Shipbuilding Co. by Inland Steel Co. Largest on the lakes, it will enter the 1950 shipping season. . . Steel ingot output for May established a peacetime record (p. 69) at 7,564,626 tons. . . Overtime pay practices may have to be revised (p. 72) to conform with the Supreme Court ruling in the longshoremen's case. . . Industrial production (p. 82) has pushed to the highest level since February. . . British steel production goals have been raised as result of better than expected output (p. 75). . . War Assets Administration is trying to complete disposal of all surplus plants in the Midwest (p. 80). . . Procurement of new naval aircraft has been mapped out (p. 78) under the $653 million authorization.

Steel Hard to Get?

Demand Still Exceeds Supply But . . .

. . . this is a typical view of night loading operations at a Ryerson steel-service plant. The steels specified on several orders are on their way to a loading platform for delivery the following morning. Possibly none of these orders are completely filled—however, the fact remains, we are doing our very best to serve a large group of steel users.

Unfortunately, it often seems that the particular steel *you* want is never on hand, and it is true that we are always short of some kinds and sizes. But our stocks turn over fast. A size that is out today may be in tomorrow. And in spite of current conditions, we still believe the over-all stocks at our thirteen plants are the nation's largest.

Carbon and alloy steels, hot rolled or cold finished, and stainless steel in practically every analysis and finish are in stock, ready for your call. So do not hesitate to get in touch with us —on any requirement. You'll find that every Ryerson steel man will do everything possible to help you get the steel you need, when you need it.

Joseph T. Ryerson & Son, Inc. Plants at: New York, Boston, Philadelphia, Detroit, Cincinnati, Cleveland, Pittsburgh, Buffalo, Chicago, Milwaukee, St. Louis, Los Angeles, San Francisco.

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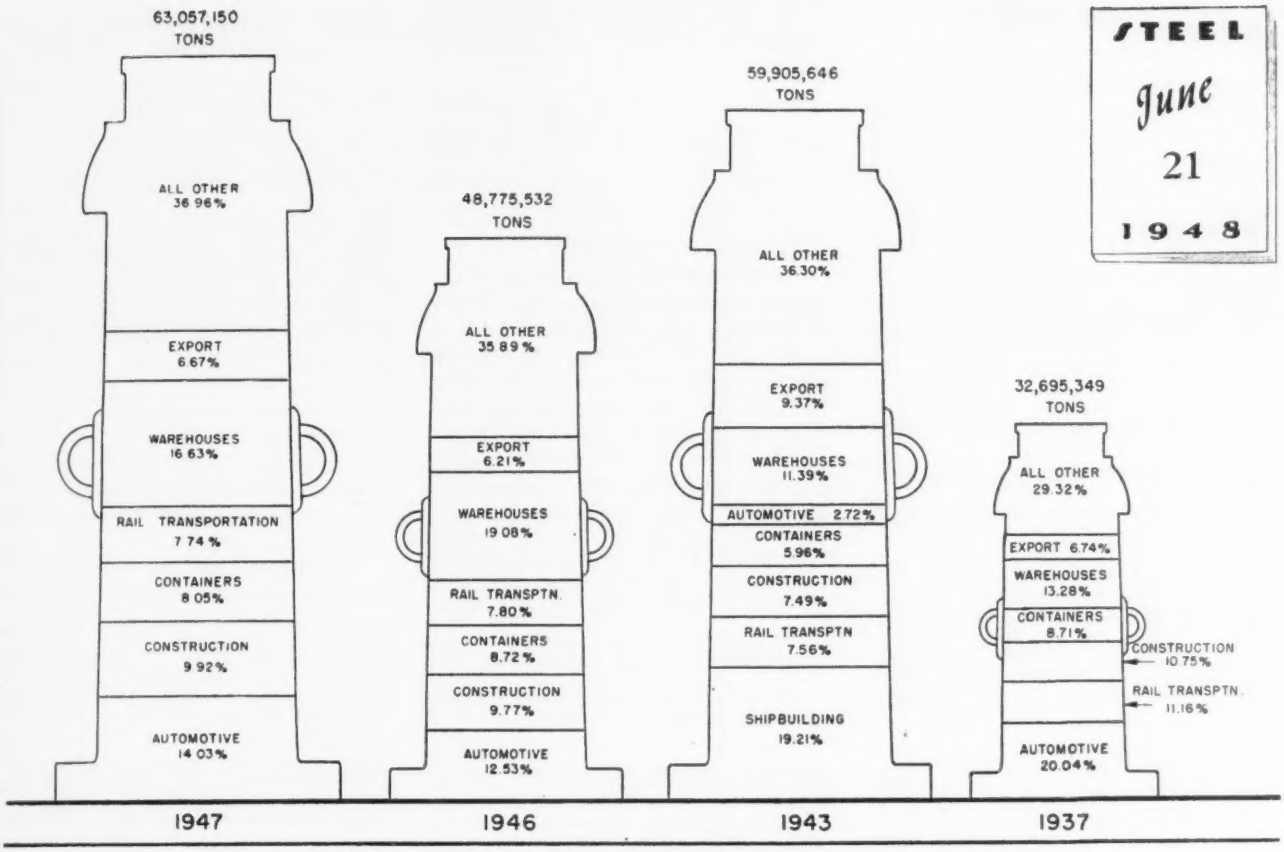


"Where's all the steel going?" has been a common postwar question. Answer to where it went in 1947 is provided graphically above, along with comparisons of the postwar year of 1946, the war year of 1943, and the prewar year of 1937. The automotive industry, exclusive of tractors, followed its usual peacetime pattern and ranked as the largest consumer in 1947. However, in 1943 wartime needs made shipbuilders the biggest consumers

Automakers Take Record Steel Tonnage

Lead all other industrial consumers with 14.03 per cent of total. Warehouses receive 10,484,144 tons, 16.63 per cent of total shipments. Construction is third

THE AUTOMOTIVE industry has demonstrated again that it is the nation's No. 1 consumer of steel in peacetime.

It retained this ranking by receiving 14.03 per cent of all the finished steel products shipped in 1947, an annual report issued last week by the American Iron & Steel Institute, New York, shows. In addition to the direct shipments the auto industry received 426,944 tons of forgings from converters and processors.

Although the automotive industry was the leading consumer, it was outclassed in its receipts of steel by jobbers, dealers and distributors, who took 16.63 per cent of the finished steel from mills last year.

The 1947 shipments of all grades of finished steel including alloy and stainless totaled 63,057,150 net tons which was distributed in the following order:

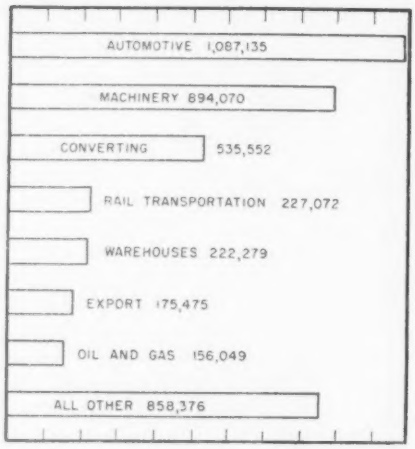
		Tons
1.	Jobbers, Dealers, Distributors	10,484,144
2.	Automotive, excluding tractors	8,846,419
3.	Construction, Maintenance	6,257,559
4.	Converting and Processing	5,632,824
5.	Containers	5,076,170
6.	Rail Transportation	4,879,879
7.	Unclassified	4,660,795
8.	Export	4,206,692
9.	Machinery, Industrial Equip., Tools	3,031,719
10.	Contractors' Products	2,243,399
11.	Domestic and Commercial Equipment	1,680,259
12.	Electrical Machinery and Equipment	1,595,520
13.	Appliances, Utensils and Cutlery	1,564,722
14.	Agricultural	1,244,548
15.	Oil and Gas Drilling	930,731
16.	Shipbuilding	337,961
17.	Mining, Quarrying, Lumbering	287,670
18.	Ordnance, Other Military	56,908
19.	Aircraft	39,231

Receives Record Tonnage — Not only did the automotive industry, exclusive of tractors, continue as the leading consumer of steel in 1947 but it received more steel than ever before. In some years the auto industry received a greater percentage of the total mill shipments than in 1947 but in those years the total shipments were considerably less than those of last year. In 1947 the mill shipments were greater than in any other peacetime year and were exceeded by only one wartime year—1944—when shipments totaled 64,193,159 tons. In that year, however, the automotive industry was given only 2.35 per cent of the total, or 1,507,008 tons. Leading consumer that year was shipbuilders, who, by receiving 16.02 per cent or 10,287,299 tons, exceeded the automotive industry's alltime record of 8,846,419 tons in 1947. In 1946, the automotive industry was given 6,112,120 tons, or 12.53 per cent of total shipments of 48,775,532 tons.

Warehouses also received more steel in 1947 than ever before, although their percentage of total mill shipments was not an alltime record. The increase in shipments to warehouses reflects the fact there are

Alloy Steel

(1947 distribution, except stainless, net tons)



more steel consumers in business today than before the war. Warehouse receipts in 1947 were approximately 57 per cent greater than those of 1940 and 13 per cent larger than those in 1946 when warehouses received 9,304,817 tons, or 19.08 per cent of the total mill shipments.

All Consumers Receive More—The 1947 distribution pattern differed from that of 1946 only in that containers which were in fourth place in 1946 dropped to fifth place and converting and processing rose from fifth to fourth, and that appliances, utensils and cutlery which were in twelfth place in 1946 dropped to thirteenth, taking the place of electrical machinery and equipment, which rose to twelfth place in 1947. However, every one of the 19 groups in the institute's report received more tonnage in 1947 than in 1946.

Production-wise, shipments of the five leading finished steel products in 1947 followed the pattern of 1946. These five products accounted for half of all the 1947 mill shipments and nearly half of those in 1946:

Product	1947 (Net Tons)	1946 (Net Tons)
Hot-rolled bars	7,983,848	6,397,137
Hot-rolled sheets	7,300,881	5,521,463
Plates (sheared, universal)	6,345,216	4,152,181
Cold-rolled sheets	5,504,578	4,075,554
Structural shapes	4,436,129	3,474,284
Totals	31,570,652	23,620,619

Exports at Peacetime Peak—Indicating the importance of the United States as a steel supplier to the world, the institute's report shows exports of finished steel in 1947 were 4,206,692 net tons, a new peacetime record. Thus, exports accounted for 6.67 per cent of total mill shipments in 1947. In 1946, when the export percentage was 6.21 the tonnage moved out of the country totaled 3,026,771. Peak in exports of finished steel during the war was 8,098,874 net tons in 1940. That accounted for 17.66 per cent of mill shipments of 45,850,825 tons that year.

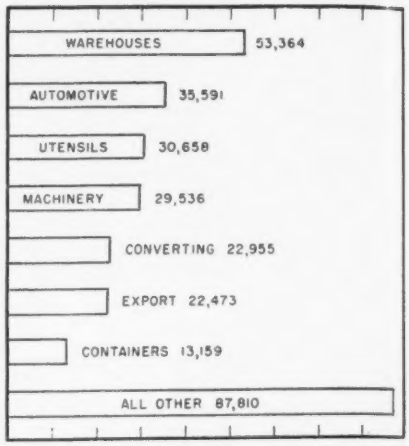
Bulk of the 1947 exports were comprised of 12 products, as follows:

Product	Net Tons
Hot dip tin and terne plate	506,347
Plates (sheared, universal)	455,300
Hot-rolled bars	452,010
Structural shapes	362,555
Ingots, blooms, billets, slabs, sheet bars, and seamless tube rounds	338,606
Rails, over 60 lb	286,219
Hot-rolled sheets	213,120
Seamless tubes	189,470
Concrete reinforcing bars	181,564
Cold-rolled sheets	113,360
Butt weld pipe	110,131
Drawn wire	106,896

Alloy Shipments Up—Distribution of alloy (other than stainless) steel in 1947 totaled 4,156,008 net tons, compared with 3,325,122 tons in 1946. The automotive industry, not including tractors, took a fourth of the 1947 distribution and was the leading consumer as well as the steel mills' No. 1 customer for alloy. Warehouses accounted for only 222,279 tons.

Stainless Steel

(Distribution in 1947, net tons)



Eight products comprised 93 per cent of all alloy shipments in 1947:

Product	Net Tons
Hot-rolled bars	1,716,187
Hot-rolled sheets	745,370
Ingots, blooms, billets, slabs, sheet bars, and seamless tube rounds	379,551
Seamless tubes	325,931
Cold-rolled sheets	251,474
Cold-finished bars	196,200
Plates (sheared, universal)	166,106
Cold-rolled strip	103,719

Stainless Output Steady—The automotive industry, excluding tractors, was the leading consumer in 1947 of stainless steel also, although the auto industry's receipts of 35,591 net tons were exceeded by the 53,364 tons shipped to warehouses.

Shipments of stainless in 1947 varied little from those of 1946, the 1947 total being 295,546 net tons compared with 293,876 tons in 1946.

Cold-rolled strip led the five chief items in 1947 stainless shipments:

Product	Net Tons
Cold-rolled strip	101,288
Cold-rolled sheets	67,480
Hot-rolled sheets	32,358
Hot-rolled bars	25,176
Cold-finished bars	22,762

Distribution of Steel Products—1947

(In net tons of leading products of all grades, including alloy and stainless)

Market Classification	Shapes	Plates	Hot-Rolled Bars	Cold-Finished Bars	Seamless Tubing	Drawn Wire	Hot-Rolled Sheets	Cold-Rolled Sheets	Coated Sheets	Hot-Rolled Strip	Cold-Rolled Strip	Total (All Products)
Converting and Processing	53,098	547,383	2,445,133	166,972	149,479	1,058,831	896,842	56,055	15,215	454,960	87,164	11,350,589
Jobbers, Dealers, Distributors	857,082	922,459	1,219,939	460,250	831,371	199,448	871,393	459,335	440,021	129,352	47,349	10,484,144
Construction, Maintenance	1,855,663	1,546,175	376,214	3,895	329,064	23,928	348,999	39,346	88,677	63,152	21,080	6,257,559
Contractors' Products	11,440	162,788	169,507	11,566	21,958	36,684	596,651	382,878	461,955	94,276	70,890	2,243,399
Automotive, excl. Tractors	47,286	365,704	1,638,924	264,933	13,502	234,483	2,180,808	2,794,328	97,325	476,426	327,046	8,846,419
Rail Transportation	582,737	931,193	418,212	7,148	2,616	2,870	292,577	36,065	52,573	32,570	3,479	4,879,879
Shipbuilding	50,354	226,027	26,461	2,538	1,678	725	12,254	3,203	6,094	1,141	471	337,961
Aircraft	.....	3,284	2,792	4,288	1,267	1,011	2,272	2,350	623	1,000	2,002	39,231
Oil, Gas Drilling	37,971	88,259	75,749	11,907	397,642	404	30,044	2,136	853	1,364	364	930,731
Mining, Quarrying, Lumbering	29,099	50,083	54,425	2,558	4,832	2,862	18,606	3,060	2,170	2,696	98	287,670
Agricultural	52,394	96,273	507,932	71,611	1,786	34,708	171,231	36,452	87,246	102,105	3,913	1,244,548
Machinery, Industrial Equip., Tools	234,046	693,881	731,202	297,689	107,199	106,960	281,824	100,900	17,997	126,962	64,755	3,031,719
Elect. Machinery, Equip.	43,223	145,720	103,346	44,341	1,393	56,643	245,313	122,030	31,453	78,885	42,530	1,595,520
Appliances, Utensils, Cutlery	1,376	10,807	20,109	45,590	2,765	40,588	329,472	576,387	98,769	58,062	86,777	1,564,722
Other Domestic, Commercial Equip.	14,492	136,297	81,640	52,139	2,819	275,530	222,717	413,120	59,306	93,352	176,697	1,680,259
Containers	1,487	114,287	22,283	510	3,541	102,549	703,413	314,579	47,643	179,453	110,898	5,076,170
Ordnance, Other Military	463	6,610	10,435	2,181	146	537	2,092	721	65	405	1,819	56,908
Unclassified	204,003	61,913	585,687	147,253	160,084	487,089	459,294	76,771	33,134	79,088	461,155	4,660,795
Export	362,555	455,300	452,010	59,984	189,470	106,896	213,120	113,360	69,651	73,491	18,664	4,206,692
Total	4,438,769	6,564,443	8,942,000	1,657,353	2,222,612	2,772,746	7,878,922	5,533,076	1,610,770	2,048,740	1,527,151	68,774,915
*Less shipments to members of industry for conversion	2,640	219,227	958,152	11,850	139,926	181,783	578,041	28,498	889	308,655	28,030	5,717,765
Net total	4,436,129	6,345,216	7,983,848	1,645,503	2,082,686	2,590,963	7,300,881	5,504,578	1,609,881	1,740,085	1,499,121	63,057,150

* All of these shipments were made to the group classified as "Converting and Processing."

New Steel Company Formed

Former officers of Empire Steel Corp. lease naval industrial reserve plant at Birdsboro, Pa. Plan ingot production within next 30 days

FORMATION of a new steel company, Penn-Ohio Steel Corp., by a group of former officers of the Empire Steel Corp., Mansfield, O., was announced last week. Headed by Joseph B. Montgomery Jr., former president and chairman of the board at Empire, as president, and Samuel S. Magid, New York, former chairman of the Empire executive committee, as board chairman, the new company has leased the Naval Industrial Reserve plant at Birdsboro, Pa.

The Birdsboro plant is equipped with two basic open hearth furnaces with capacity of 6000 to 7500 tons of ingots monthly.

Empire Steel was purchased by Studebaker Corp. last fall.

Production of ingots at the Birdsboro plant is expected to be under way within the next 30 days, according to Mr. Montgomery. "The contemplated production will be expanded in such a manner as to result in a new steel industry in Birdsboro, as well as providing the Navy with a greatly expanded reserve steel producing capacity."

Negotiations are under way for the acquisition of additional steel producing and finishing facilities, Mr. Montgomery said.

Other offices of the new company include William Lake, vice president in charge of production; and Roy I. Mitchell, vice president and controller. Both held similar posts with Empire. J. G. Baker, formerly with Colorado Fuel & Iron Corp., and president of General Steel Corp., will be chairman of the executive committee.

Newport Starts 80-Ton Electric Furnace

An 80-ton electric furnace, part of a purchase from the WAA, has just been put into operation for the first time by the Newport Rolling Mill.

Operation of the furnace, which was incomplete at close of the war, is one step in a $6,000,000 expansion program, and will increase rated capacity to 43,000 tons of ingots a month.

Newport's program includes a continuous hot-strip mill now under construction and scheduled for rolling in October.

Present facilities, in addition to the electric furnace, include seven open hearths and a blooming and bar mill, rolling mill and fabricating shops. The division employs about 2400 men in northern Kentucky. Pig iron is supplied from a Martins Ferry, O., blast furnace recently bought.

Expansion in operations brought demands for electric power exceeding capacity of the company's own power plant, and supplementary power is being obtained from outside sources.

Geneva Steel To Petition Against Utah Sales Tax

Geneva Steel Co., Geneva, Utah, is planning to file a petition with the Utah Supreme Court for review of the deficiency use tax assessment levied on the company by the Utah tax commission. The assessment includes $37,976 for interest accrued since the sale of the plant in June, 1946, to United States Steel Corp. by War Assets Administration.

The tax commission, in the meantime, has begun an investigation as to whether a sales tax is due on seven other transactions involving war surplus plants. Included in this inquiry is the recent sale of the Ironton steel plant to the Kaiser interests.

Gerity-Michigan Books Record Order Volume

Gerity-Michigan Corp., Detroit, has booked almost $19 million in orders for the fiscal year ending June 30, 1949, it has been announced by James Gerity Jr., president. Of this total, slightly more than $14 million represents orders from automotive firms.

The automotive industry will provide Gerity-Michigan with more volume in 1949 than its total business in the year ending June 30, 1948.

Present, Past and Pending

■ $2.5 MILLION TOOL PLANT TO BE BUILT
DETROIT—Whitman & Barnes Division, United Drill & Tool Corp., has awarded a $2,500,000 contract to Austin Co., Cleveland, for construction of a new plant on a 26-acre site at Plymouth, Mich.

■ RENEGOTIATION GETS HOUSE COMMITTEE'S NOD
WASHINGTON—All procurement by the Army, Navy and Air Force would be subject to contract renegotiation under an amendment to the Second Deficiency Appropriations Bill reported out by the House Appropriations Committee last week. Provisions of Public Law 547 approved for renegotiation contracts placed under the 70-group Air Force program.

■ NEW PLANT FOR LINCOLN ELECTRIC PLANNED
CLEVELAND—Lincoln Electric Co. plans to build a $10 million plant here providing more efficient layout of production lines and increased capacity. Construction will begin next spring with occupancy scheduled for late in the year. Present facility will be sold.

■ COPPERWELD SALE RUMOR HELD UNFOUNDED
WARREN, O.—Rumors that Copperweld Steel Co. is to be sold were said to be unfounded last week by C. W. Holmquist, executive vice president in charge of the Steel Division. The company, which reportedly would not accept orders after June 30 because of the rumored sale, is fully booked for the rest of the year, he said.

■ I-H ADVANCES POWER MACHINERY PRICES
CHICAGO—Higher prices on industrial power machines were announced last week by International Harvester Co., following the farm tractor price revisions of the previous week. The increases average 7.9 per cent for all models of power units, 6.5 per cent on crawler tractors and 10 per cent on industrial wheel tractors.

■ RIGID CONDUIT CASE REHEARING DENIED
CHICAGO—Petition of respondents in the rigid steel conduit case for rehearing in the Seventh Circuit Court at Chicago has been denied, thus clearing the case for appeal to the Supreme Court.

Pig Iron Allocation Opposed

Spokesmen for gray iron and malleable foundry groups, at public hearing, disapprove plan to allocate 110,000 to 128,000 tons monthly for housing program

OPPOSITION to proposed allocation of 110,000 to 128,000 tons of pig iron monthly for the residential housing program was expressed by three industry spokesmen at a recent public hearing in the Commerce Building, Washington, by the Office of Industry Co-operation, Commerce Department.

One of them was James M. Underwood, president, Vulcan Mold & Iron Co. Another was John M. Price, president, Ferro Machine & Foundry Co. Inc., Cleveland, who appeared on behalf of the Gray Iron Founders Society. The third was H. S. Colby, whose brief on behalf of the Malleable Founders Society was filed by proxy in his absence.

Some Favor Program — Others who spoke at the public hearing were in favor of the program, and urged its speedy implementation. Those favorable to the plan, of course, were from industries that are designated to get more pig iron under the proposed allocations.

The program, it was explained, is gaited to contemplated production of housing at an annual rate of 1 million units. Castings requirements of such a program carried through next February—which marks termination of the voluntary agreements allocation plan as authorized by Congress under Public Law 395—are figured at 2,634,000 tons.

Mathias Niewenhous, head of OIC's Building Materials Negotiating Division, reported the required production of the various types of castings as follows: 645,000 tons of cast iron soil pipe and fittings; 1,330,000 tons of cast iron pressure pipe and fittings; 190,000 tons of cast iron boilers; 165,000 tons of cast iron radiation; 40,000 tons of cast iron plumbing drainage; 164,000 tons of castings for warm air furnaces.

Blames High Scrap Price — Mr. Price, speaking for the Gray Iron Founders Society, said his group opposed channeling foundry iron into certain products during peacetime since it believed that production, if fairly distributed, is sufficient to meet regular and special needs. The position of the gray iron founders, he said, was that the fairest and most equitable distribution of iron can be achieved in a free market under the American enterprise system.

He concluded his statement by declaring that the group for which he spoke believed that the whole agitation for allocation of pig iron was inspired by the high price of cast iron scrap.

In his statement for the Malleable Founders Society, Mr. Colby said that until such time as the housing agency can prove that the distribution of pig iron, free from government dictates, will not meet the requirements of the housing program, giving due consideration to the metallurgy and use of scrap in a proper ratio to pig iron, his group feels there are no grounds

SHIPMENTS OF STEEL PRODUCTS FOR APRIL AND YEAR TO DATE

Steel Products	Number of companies	Items	APRIL - 1948			To Date This Year			Whole Year 1947		
			Net Shipments (Excluding Shipments to Members of the Industry for Conversion into Further Finished Products or For Resale) (Net Tons)	Per cent of Total Shipments	Shipments to Members of the Industry for Conversion into Further Finished Products or For Resale (Net Tons)	Net Shipments (Excluding Shipments to Members of the Industry for Conversion into Further Finished Products or For Resale) (Net Tons)	Per cent of Total Shipments	Shipments to Members of the Industry for Conversion into Further Finished Products or For Resale (Net Tons)	Net Shipments (Excluding Shipments to Members of the Industry for Conversion into Further Finished Products or For Resale) (Net Tons)	Per cent of Total Shipments	Shipments to Members of the Industry for Conversion into Further Finished Products or For Resale (Net Tons)
Ingots, blooms, billets, tube rounds, sheet and tin bars, etc.	43	1	210,859	4.1	250,173	* 1,021,790	4.8	* 1,066,091	2,966,748	4.7	2,396,343
Structural shapes (heavy)	12	2	302,244	5.9	2,882	1,342,878	6.3	11,095	4,436,129	7.0	2,640
Steel piling	4	3	21,083	0.4	-	99,356	0.5	8	324,224	0.5	23
Plates (sheared and universal)	29	4	528,040	10.4	23,648	* 2,226,603	10.4	127,819	6,345,216	10.1	219,227
Skelp	6	5	11,526	0.2	19,280	52,405	0.2	139,167	160,989	0.3	384,004
Rails—Standard (over 60 lbs.)	4	6	126,030	2.5	265	636,745	3.0	3,518	2,207,146	3.5	991
—All other	5	7	18,996	0.4	191	87,149	0.4	595	211,900	0.3	329
Joint bars	7	8	13,065	0.3	3,275	49,636	0.2	12,504	173,923	0.3	15,198
Tie plates	7	9	39,699	0.8	32	165,730	0.8	211	504,779	0.8	4,437
Track spikes	8	10	9,322	0.2	-	44,994	0.2	90	163,746	0.3	146
Hot Rolled Bars—Carbon	34	11	481,406	9.4	42,898	* 2,081,139	9.7	* 215,808	6,242,416	9.9	745,770
—Reinforcing—New billet	16	12	102,888	2.0	449	438,585	2.0	2,363	1,277,075	2.0	9,775
—Rerolled	13	13	19,850	0.4	-	60,490	0.3	-	175,853	0.3	-
—Alloy	27	14	152,515	3.0	20,542	* 629,398	2.9	77,185	1,741,432	2.8	212,382
—Total	44	15	756,659	14.8	63,889	* 3,209,612	14.9	* 295,356	9,436,756	15.0	967,927
Cold Finished Bars—Carbon	27	16	107,668	2.1	543	459,231	2.1	1,516	1,426,701	2.3	9,249
—Alloy	26	17	20,537	0.4	311	* 71,382	0.3	1,564	218,802	0.3	2,601
—Total	35	18	128,205	2.5	854	* 530,613	2.4	3,080	1,645,503	2.6	11,850
Tool steel bars	19	19	7,461	0.1	139	* 27,664	0.1	445	87,279	0.1	1,670
Pipe & Tubes—Butt weld	15	20	151,040	3.0	2,227	* 643,120	3.0	9,336	1,892,691	3.0	78,080
—Lap weld	8	21	24,449	0.5	3	118,201	0.5	3	389,762	0.6	875
—Electric weld	13	22	101,312	2.0	439	483,319	2.3	1,673	1,254,325	2.0	4,274
—Seamless	17	23	241,511	4.7	13,755	* 945,289	4.4	58,602	2,581,106	4.1	157,208
Wire rods	19	24	45,957	0.9	25,099	217,453	1.0	103,524	667,282	1.1	331,192
Wire—Drawn	39	25	212,793	4.2	13,730	897,553	4.2	59,873	2,590,963	4.1	181,785
—Nails and staples	17	26	73,733	1.4	1,366	290,320	1.4	5,065	799,436	1.3	8,481
—Barbed and twisted	15	27	20,454	0.4	20	88,705	0.4	48	256,991	0.4	128
—Woven wire fence	13	28	33,047	0.7	391	133,703	0.6	1,143	407,295	0.6	3,616
—Bale ties	11	29	9,441	0.2	-	39,938	0.2	-	119,917	0.2	-
Black Plate—Ordinary	9	30	63,876	1.3	-	260,087	1.2	562	801,745	1.3	2,033
—Chemically treated	2	31	2,135	-	-	4,447	-	-	19,252	-	-
Tin and Terne Plate—Hot dipped	8	32	168,627	3.3	27	656,179	3.1	99	2,093,149	3.3	228
—Electrolytic	9	33	141,060	2.8	-	560,969	2.6	215	1,617,659	2.6	529
Sheets—Hot rolled	32	34	606,156	11.9	50,294	*2,563,720	12.0	220,160	7,891,798	12.5	578,426
—Cold rolled	16	35	567,756	11.1	1,823	2,202,899	10.3	6,981	5,504,578	8.7	28,498
—Galvanized	16	36	136,393	2.7	288	536,975	2.5	1,015	1,609,881	2.5	889
Strip—Hot rolled	23	37	131,618	2.6	34,805	554,831	2.6	121,492	1,740,085	2.7	308,655
—Cold rolled	33	38	148,286	2.9	1,983	580,016	2.7	7,977	1,613,005	2.6	28,030
Wheels (car, rolled steel)	5	39	25,743	0.5	31	105,418	0.5	355	356,873	0.6	2
Axles	5	40	17,585	0.3	1	65,256	0.3	75	185,019	0.3	53
All other	-	41	-	-	-	-	-	-	-	-	-
Total steel products	140	42	5,096,161	100.0	510,908	*21,443,573	100.0	*2,258,177	63,057,150	100.0	5,717,765

* Adjusted.

on which an allocation program can be justified.

Speaks For Gas Men — Speaking for the American Gas Association, E. I. Bjork declared that the cast iron needs of the gas distributing companies are on a par with the great need for housing, and unless these cast iron requirements are met the housing program must eventually be set back. He declared fulfillment of cast iron requirements of the gas distribution companies is of primary importance in any program involving the allocation of pig iron.

S. E. Linderman, executive vice chairman, Cast Iron Pressure Pipe Institute, pointed out that since the end of the war his industry has been faced with an increasing backlog of unfilled orders, which now totals well over 1 million tons, or a year's production. Shortage of pig iron, he said, has made it impossible for the industry to keep pace with new orders. It is felt in the industry that a substantial increase in pressure pipe output can be effected, approximately 40 per cent, if additional raw materials can be secured.

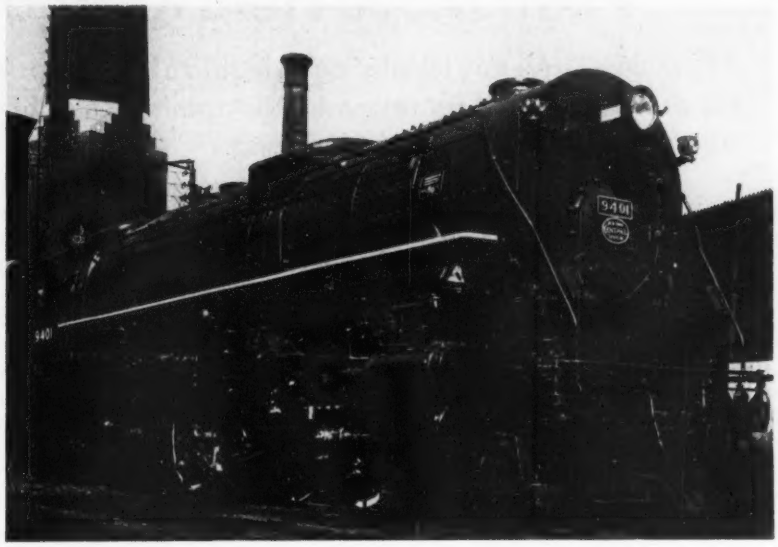
Pointing out that the allocation plan makes no provision for the relief of manufacturers of domestic electric refrigerators and gas and electric ranges, Frederic J. Ball, speaking for the Crosley Division, Avco Mfg. Corp., said that if pig iron is made available for housing in the quantities proposed, it will seriously affect the ability of the refrigerator and range manufacturers to keep abreast of the new housing program unless they are included in the program. Diversion of pig iron to housing, he said, will greatly reduce the availability of sheet metal for refrigerators, etc.

Steel Product Shipments Decline During April

Net shipments of steel products declined 882,390 tons in April to a total of 5,096,161 tons from 5,978,551 tons in March and compared with 5,445,993 tons in April, 1947, according to the American Iron & Steel Institute. In addition, shipments to members of the industry for conversion into further finished products or for resale amounted to 510,908 tons in April and 574,720 tons in March.

Net shipments for the first four months amounted to 21,443,573 tons compared with 20,447,827 tons for the like 1947 period.

The product mix showed only minor changes in April compared with that of a year ago.



Steam Locomotives on Way Out

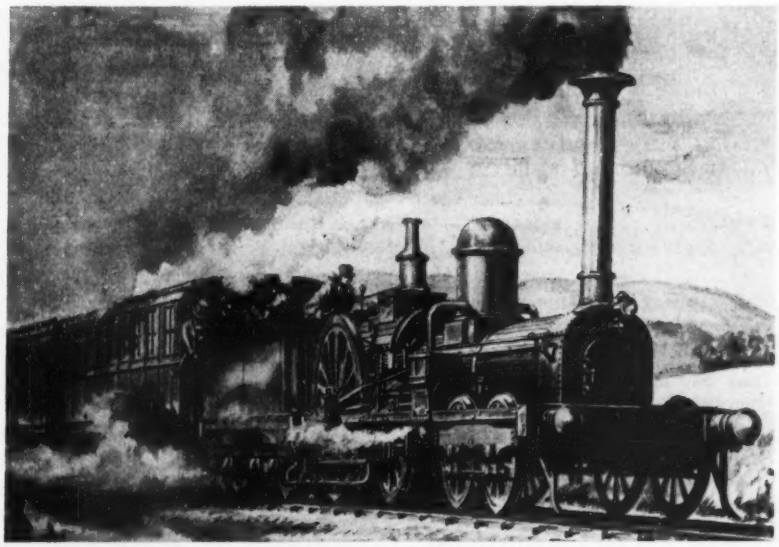
AMERICAN railroads largely will be dieselized by 1955 and steam locomotives gradually will fade from the rail transportation picture. This prediction, heard frequently in the past few years, was reiterated at the summer meeting of the Society of Automotive Engineers at French Lick, Ind., by J. W. Barriger of the Chicago, Indianapolis & Louisville Railway.

Coincident with Mr. Barriger's forecast, the American Locomotive Co. announced it was ending production of steam locomotives and converting its facilities to the manufacture of diesel-electric units. Alco is celebrating 100 years of building locomotives and during that time has completed approximately 75,000 steam engine units.

The last steam unit, shown above, has just been delivered to the Pittsburgh & Lake Erie. Shown below is the "Lightning," first steam unit produced by Alco in 1848 and used by the Utica & Schenectady Railway.

Alco has invested more than $20 million to convert its facilities to diesel-electric locomotive production and estimates diesel output this year will be 150 per cent of that for 1947. All new orders being received are for diesel-electrics.

While Alco has no orders for steam locomotives on hand or in sight, a part of its steam facilities at Schenectady will be "mothballed" to meet any future demand, domestic or foreign, for steam locomotives.



Basing Point Move Held Retreat

FTC counsel says any legislation to legalize banned pricing practices would be return to NRA philosophy. Sees no way to preserve identical pricing

ADOPTION of legislation that would legalize basing point or other pricing which has been held illegal by the Supreme Court would be a retreat to the philosophy of the National Industrial Recovery Act, Walter B. Wooden, associate general counsel, Federal Trade Commission, declared last week in an address discussing the cement basing point case at the Washington conference of the American Marketing Association.

Pointing out that under the NRA, industry codes were approved providing for systems of fixing prices by private industry, Mr. Wooden said that "not infrequently these code agreements were continued by mutual consent after NRA, and the Federal Trade Commission has been compelled to institute proceedings against a number of industries which seem to think that they had at least a moral right to continue what the law no longer countenanced."

Cites Steel Code — Citing the NRA Steel Code as an outstanding example in that it openly set up the multiple basing point system, specified basing points and provided elaborate devices for insuring adherence to the system of identical delivered prices, Mr. Wooden said he sees no way in which the force of the cement decision can be overcome by legislation without returning to the NRA program and philosophy.

Mr. Wooden held that to argue the cement decision requires little change, since it runs only against a combination or planned common course of action, and that individual sellers can independently continue to discriminate in their net factory prices, is faulty thinking in that such assumes the good-faith meeting of competition which the law requires and which the Supreme Court held in the Cement case and in the Glucose cases did not exist.

That argument also overlooks the fact, he declared, that the Supreme Court in the Cement decision has reiterated its pronouncement of three years ago in the Glucose cases that the law does not contemplate a meeting of competitors' delivered prices through systematic and reciprocal variations among sellers in their net factory prices even on a freight absorption basis.

No Escape — "As a practical matter," he said, "I see no way by which the status quo of identical delivered price systems can be preserved by passing them off as individual, independent action. That attempt was made in the Cement case and the courts have rejected it."

According to Mr. Wooden, the true legal and economic effects of the decision will be found somewhere between the extremes of the views expressed in industry. He felt that if there are no substantial changes in the competitive situation resulting from the decision, then the whole business of anti-trust law enforcement is a delusion, producing only technical triumphs and visionary victories worth no more than the paper on which the law records them.

Favorite Criticism — Mr. Wooden, pointing out that a favorite criticism of the legal attacks on the basing point system as a price fixing device is that if such attacks are successful industry would be "Balkanized," maintained that such involves an admission that industry does not operate as a number of autonomous independent competitors which the law requires, but rather as a single cartelized unit in which there is no freedom of competitive action on prices.

He held that systematic and reciprocal freight absorption with consequent identity of delivered prices involves the economic waste and absurdity of cross-hauling. That, he insisted, does not take place under free competitive conditions. Freight absorption, he declared, is the economic equivalent of dumping in foreign trade.

An important trend that may come out of the Cement decision, Mr. Wooden said, is the accentuation of the trend toward mergers of competing corporations. Present state of the law, he pointed out, permits such mergers up to the point where they clearly create a very high degree of monopolistic dominance violative of the Sherman act.

"The Cement decision," concluded Mr. Wooden, "has been characterized by its critics as 'momentous.' Those who approve the decision can agree with that characterization, for it provides what may be our last clear chance to restore and preserve a real competitive economy, one in which local enterprise is not the stunted and stifled victim of predatory discrimination."

Hearing on Chain Pricing Held

Federal Trade Commission examiners take testimony in case against metal lath manufacturers also. Illegal pricing methods and discrimination charged

TWO more actions of the Federal Trade Commission involving charges of illegal pricing methods have made substantial progress toward conclusion during recent months. One is the case against the Chain Institute et al and the other against the Metal Lath Manufacturers Association et al.

In the Chain Institute case opposing attorneys on June 9, after hearings that stretched over four years, appeared before Trial Examiner Webster Ballinger and set forth their understanding of the facts shown in the record of testimony compiled during the hearings.

Mr. Ballinger now will go into seclusion and his next and final move in the case will be to make a report of facts in the case, with recommendations, to the commission. After that, the commissioners will rule whether or not to issue a cease-and-desist order. Trial attorney Karl Steinhauer, who handled this case, expects such an order to ensue.

Metal Lath Case — In the Metal Lath case hearings were held June 9 in Cincinnati. The witnesses on that occasion were William M. Goldsmith, vice president and treasurer, Goldsmith Metal Lath Co., Cincinnati, and Donald D. Connors, now with Goldsmith but formerly in charge of metal lath sales for Truscon Steel Division, Republic Steel Corp. They were questioned about the pricing system in vogue on metal lath. Two more witnesses who are still due to appear were scheduled by the trial examiner, Everett Haycraft, to be heard Sept. 7 and 8. After that the government plans to rest its case, after which the respondents will have their innings.

The Chain Institute case involves a charge of a conspiracy to fix identical delivered prices on chain products, and price discrimination. The Metal Lath case involves a charge of price conspiracy and an illegal zone pricing system.

Labor Winning Third Round Wage Battle

INDUSTRY'S anti-inflation program —no wage increases coupled with price reductions — appears to be crumbling. Patterns for third round wage increases are taking form in the automotive, electrical, rubber, aircraft and some other major industries. In some cases, the wage advances are being accompanied by price increases.

These developments of the past few weeks have revived interest in the wage and price policy of the basic steel industry, a leader in the anti-inflation plan. Two months ago United States Steel Corp. defined the program by announcing it was refusing the United Steelworkers' demand for a substantial wage increase and simultaneously announced price reductions on its products amounting to $25 million annually. Other steelmakers followed the U. S. Steel example.

Door Left Open — At that time, Ben Fairless, president of U. S. Steel, said the corporation was "hopeful that our action in reducing the prices of a number of steel products associated with the cost of living may have a beneficial effect throughout the nation and may be helpful in bringing about an early stabilization or reduction in the cost of living.

"If this should prove to be the outcome, everyone in the country will benefit. If, on the contrary, costs should continue to advance, then in fairness to our employees and stockholders we will have to consider at some later date the adequacy of both wages and steel prices under the then existing conditions."

Under the two-year contract of the union and the basic producers, the union has no power to strike or otherwise press its demands for a wage adjustment. However, some members of the industry believe reconsideration of the wage issue may be necessary.

Going Up — General Electric Co., which spearheaded the anti-inflation campaign by cutting prices early this year and by refusing demands for increased wages by the electrical workers union, capitulated and granted an 8 per cent increase. GE raised prices on a variety of consumer and industrial products 5 to 12 per cent.

Westinghouse offered a 6 per cent increase plus a more liberal pension and insurance program, amounting to 4 cents an hour, but the union last week had refused to accept.

Automotive companies were following the Chrysler settlement more frequently than the General Motors settlement which geared future wage rates to the cost-of-living index. Packard raised wages 13 cents an hour, boosted prices $75 to $200 a car. Nash-Kelvinator upped wage rates by 13 cents, raised car prices $75 to $90. Kaiser-Frazer gave 13 cents, and substituted a social security plan for the old bonus plan. Briggs Mfg. Co. granted 13 cents. White Motor settled for 11 cents.

Aluminum Co. of America offered an 8 per cent increase, but the United Steelworkers were slow to accept it. Budd Co. settled for 13 cents an hour. Lima Locomotive signed for 10 cents an hour.

Four operating divisions of United Aircraft gave 10 per cent increase.

Iron, Steel Employment, Earnings Cut in April

Total payroll of the iron and steel industry in the first four months of this year was $699,278,000, an increase of $84 million over the corresponding period of last year, according to the American Iron & Steel Institute.

Partly because of the coal miners' walkout, April employment, hours and weekly earnings declined from March. Employment was estimated at 626,200, including 532,500 wage earners, compared with a total of 628,800 in March. Average work week for wage earners was 38.0 hours, compared with 40.6 in March, but their average hourly pay rate was up from $1.548 in March to $1.551 in April.

Contract for Large Ore Boat Let by Inland Steel

Inland Steel Co., Chicago, last week awarded a contract to Americal Ship Building Co., Cleveland, for construction of what it said will be the largest and fastest ore carrier on the Great Lakes. The ship, which is to be built at American's Lorain, O., yard, will be delivered in time for the 1950 navigation season.

It will be 668 ft long, with a molded breadth of 70 ft and a molded depth of 37 ft. At its intermediate draft of 24½ ft, it will carry 20,000 tons of cargo.

OIC Appoints Jobber Advisory Committees

Appointment of industry advisory committees to represent the general steel products distributors and merchant steel products distributors by Secretary of Commerce Charles Sawyer was announced last week by the Office of Industry Cooperation. The general steel products industry advisory committee will represent distributors handling heavy commercial steel products. The merchant steel products advisory committee will represent distributors of wire, nails, roofing, etc.

Steel Ingot Output Sets Peacetime Record for May

Steel ingot production in May established a new peacetime high for that month, having recovered from the coal strike setback in April, according to the American Iron & Steel Institute. Output of ingots and steel for castings totaled 7,564,626 tons in May compared with 6,218,157 tons in April and 7,339,014 tons in May, 1947.

The operating rate rose to 94.7 per cent of capacity in May, the same rate as for the like 1947 month, from 80.4 per cent in April. In March, the rate was 95.3 per cent, highest so far this year.

Production in the first five months of the year was 35,803,898 tons compared with 35,360,843 tons in the like 1947 period.

Electric furnace production of steel set a peacetime record in May at 405,786 tons.

STEEL INGOT PRODUCTION STATISTICS

	Estimated Production—All Companies									
	—Open Hearth—		—Bessemer—		—Electric—		—Total—		Calculated	Number
	Net tons	Per cent of capac.	Net tons	Per cent of capac.	Net tons	Per cent of capac.	Net tons	Per cent of capac.	weekly production Net tons	of weeks in mo.
Jan.	6,768,497	95.5	343,169	77.5	361,110	79.0	7,472,776	93.6	1,686,857	4.43
Feb.	6,245,338	94.3	340,596	82.3	354,270	82.9	6,940,204	93.0	1,676,378	4.14
Mar.	6,841,578	96.6	363,235	82.0	403,322	88.2	7,608,135	95.3	1,717,412	4.43
1st qtr. .	19,855,413	95.5	1,047,000	80.6	1,118,702	83.4	22,021,115	94.0	1,693,932	13.00
*Apr. ..	5,640,168	82.2	185,089	43.2	392,900	88.7	6,218,157	80.4	1,449,454	4.29
†May ...	6,803,278	96.0	355,562	80.3	405,786	88.7	7,564,626	94.7	1,707,591	4.43

* Revised. † Preliminary figures subject to revision.

For 1948, percentages of capacity operated are calculated on weekly capacities of 1,599,286 net tons open hearth, 99,962 net tons bessemer and 103,228 net tons electric ingots and steel for castings, total 1,802,476 net tons; based on annual capacities as of Jan. 1, 1948, as follows: Open hearth 83,610,690 net tons, bessemer 5,226,000 net tons, electric 5,396,770 net tons, total 94,233,460 net tons.

Windows of Washington

By E. C. KREUTZBERG *Washington Editor, STEEL*

Senator Murray calls for expansion of steel ingot capacity to 105 million tons. Charges shortage cost nation more than $15 billion in lost business and wages in 1947

EXPANSION of this country's steel capacity to 105 million tons annually and immediate government control of steel allocations are proposed by Sen. James E. Murray, ranking Democrat on the Senate Small Business Committee. His report is the latest blast in the controversial issue of enlarging steel capacity.

Industry representatives hold that the huge construction program proposed by the expansionists in government and labor circles is not feasible. **Building costs are too high. Installation of new steel capacity now would drain scarce steel from urgent consuming needs. Raw materials are** not available to operate an expanded capacity. Anyway, they believe present capacity will be adequate for all normal needs as soon as the extraordinary postwar demand has been satisfied. And, they continue, a large part of the present shortage was caused not by lack of capacity but by postwar strikes which prevented full utilization of present capacity.

Senator Murray, however, charges that the steel shortage last year cost the nation $15 billion in lost business and an additional $250 million that small business men had to pay in excessive prices to obtain steel in the gray market.

The senator also charges the large steel corporations are refusing to increase their capacity in order to squeeze out smaller competitive manufacturers of steel products. He challenges the industry assertion that too great an expansion will result in idle plants during the periods of poor business.

"Either the industry must provide enough capacity to meet our national needs at all times, or the government must assume some share of the burden of providing the needed capacity," the senator writes.

"Without government construction of steel, rubber, aluminum and other facilities during the war, the war would either have been lost or would have gone on much longer."

ECA Cut Means Less Machinery

Unless Congress restores the House cut in its budget request the Economic Co-operation Administration will have to cut out purchase of machine tools and other capital equipment for Europe, ECA Administrator Paul Hoffman told the Senate Appropriations Committee June 11. The amount voted by the House will suffice only to buy necessary food and other consumer goods and will not permit supplying to Europe the capital assistance it needs to revive its economy. His inference was that without the execution of the capital equipment part of the plan, the whole program might tend to become an international WPA.

RENEGOTIATION UPHELD

Constitutionality of the Renegotiation Act as a means of recovering excess war profits was upheld last week by the Supreme Court in ruling against three companies contesting the measure. Justice Harold Burton in delivering the majority opinion held the act was lawful, that it had in most instances led to settlement of disputes by agreements between the two parties, that the delegation of authority under the act to administrative officials was lawful, and that the act provided that companies dissatisfied with the renegotiation findings could appeal through the tax court.

OTS Appropriation Cut

American business will get far less service from the Office of Technical Services, Commerce Department, during the coming year than at any time since this unit was created in 1945 to publish technical information in the possession of the government. Whereas it has spent $790,000 in collecting and disseminating information in the fiscal year about to end, its appropriation for fiscal 1949 is $200,000.

That is not quite as bad as it sounds, for the OTS practically has completed processing a huge collection of reports on captured German and Japanese information. It still has many German reports to handle; these have been coming in from the British and French. But the great bulk of reports to be processed in the future are those in the files of the various departments and agencies of the United States government—in other words, reports concerned with domestic technical programs. Normally these never become available to the public.

"Where we have been processing in the neighborhood of 78,000 reports per year, we now will handle 24,000," said John C. Green, OTS director. "What we aim to do is pick out the best of the reports, those containing the most valuable and significant information, and make those available to industry, educational institutions, etc., at the usual nominal prices."

In one way the task ahead will be more difficult due to the necessity for evaluating the merits in each case. It is estimated roughly that there are some 1,600,000 reports on work in government laboratories and on government projects and, on the basis of the new appropriation, the overwhelming majority of them never will become available to the public.

Effective immediately, the OTS will publish its "Bibliography of Scientific and Industrial Reports" monthly instead of weekly. Each issue will list on an average of 2000 documents of which copies may be purchased.

FTC To Rest Steel Case

The next hearings in the action of the Federal Trade Commission seeking to prove existence of price conspiracy in the steel industry are to begin July 12. At that time, according to Lynn C. Paulson, FTC trial attorney, the government expects to rest its case. The intervening period will be devoted by Mr. Paulson and his aides to recapitulating the evidence they so far have presented, and determining whether anything has been overlooked.

During the two weeks' hearings ended June 10 Walter S. Tower, president, American Iron & Steel Institute, and a number of steel company officials were subjected to cross examination with respect to exhibits previously entered. These included price and extra cards of the companies issued since the Schechter decision in 1934, and letters obtained from the files of the American Iron & Steel Institute. New evidence introduced by the government during

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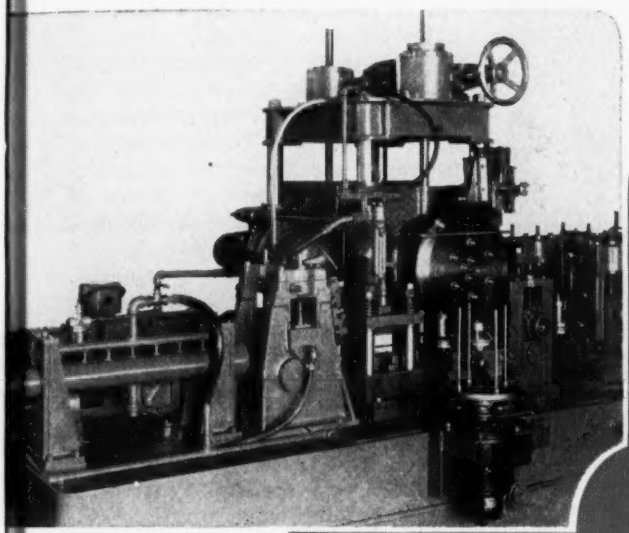

The heart of a tube mill is the welding unit. The combination of modern rotary transformer (patented) correctly mounted with proper voltage regulators permitting perfect matching of speed and heat while running, is the last word in efficient, accurate control of this all important unit. Welding electrodes accessible for changing without disturbing transformer, leads or bearings.

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1. Simplifying and centralizing all necessary controls.
2. Complete protection through approved safety devices and interlocks.
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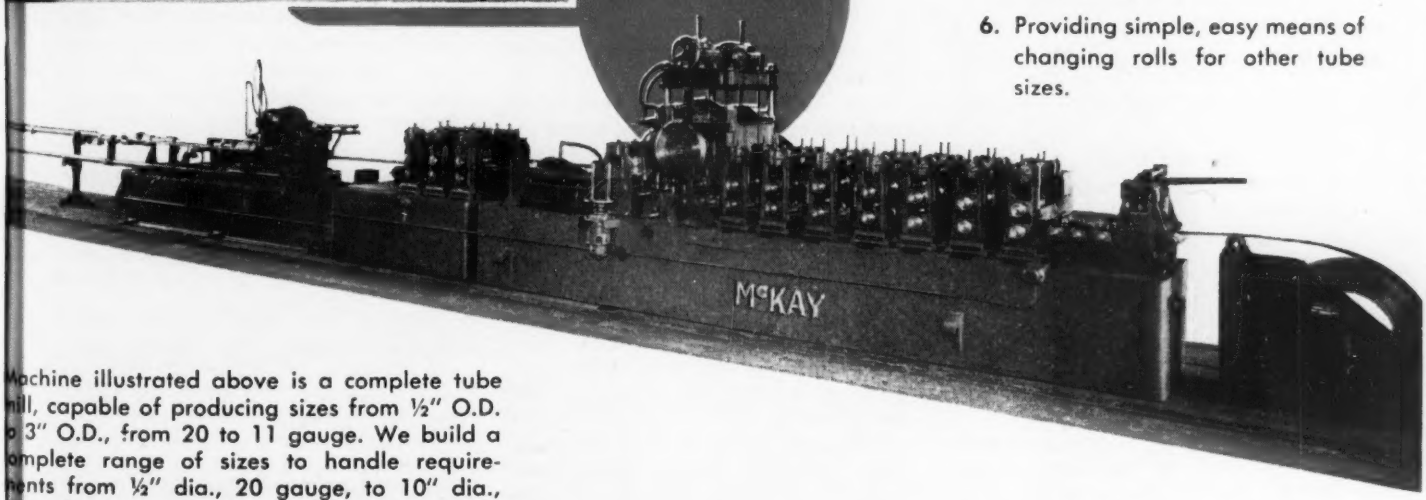

Machine illustrated above is a complete tube mill, capable of producing sizes from ½" O.D. to 3" O.D., from 20 to 11 gauge. We build a complete range of sizes to handle requirements from ½" dia., 20 gauge, to 10" dia., ¼" wall. We also build a complete line of tube and bar drawbenches. We solicit your inquiries.

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this period included excerpts from the records of the TNEC hearings and of the Wheeler antibasing point hearings in 1936.

Needed: Metals Scientist

The metals industries apparently are passing up a prime opportunity to enlarge their knowledge of technical progress abroad. Inquiry by STEEL reveals that the main reason for not having a metallurgist on the Science Mission to London is the non-availability of a suitably equipped man. Nominations of competent men would be received with favor by the State Department's International Resources Division where Ray Vernon is the man responsible for manning of the Science Mission to London.

Nominations should be made by recognized technical associations, such as the American Society for Metals, American Foundrymen's Association, National Machine Tool Builders' Association, American Society of Tool Engineers, American Society of Mechanical Engineers, American Electroplaters Society, American Welding Society, etc., rather than by individual companies. In addition to the reports which these men would send to the State Department on their observations abroad, they would be free to deliver lectures, write articles and present convention papers on their return.

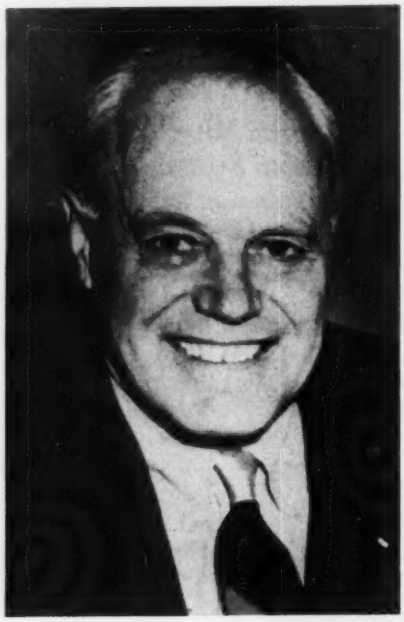
The Science Mission to London is manned on a rotating basis, each man serving on it for a limited period—usually ranging from 2 to 6 months. This means that different types of technologists could serve on the mission without having to wait too long.

At present the mission is manned chiefly by scientists who report on advances in the fields of medicine, chemistry and applied science. There is a big gap in such fields as improved steels, metal finishing, machine design, steelmaking practice and in metal fabricating techniques.

Revise Overtime Pay Practices

Employers who in the past have paid time and one-half for work performed on Saturdays, Sundays, or holidays or at hours actually outside the normal or regular working hours and have treated the extra pay as an overtime premium in good faith, relying on the interpretation of the Wage & Hour Division, are in most cases protected by the Portal Pay Act from back-wage liabilities. This was the comment last week by William R. McComb, administrator of the Wage & Hour Division, on the Supreme Court's ruling granting extra overtime to longshoremen (STEEL, June 14, p. 65).

For the future, however, some employers will have to make adjustments in their overtime pay practices to come within the scope of the Supreme Court decision. The Wage & Hour Division is changing its interpretation of the law to conform with the court ruling and will start enforcement under the revised interpretation July 1.



TRACY S. VOORHEES
of Brooklyn, N. Y., has been nominated to be Assistant Secretary of Army. An attorney in private life, he served as a colonel in Judge Advocate General's department during World War II

Mr. McComb advised both labor and management operating under the law to review their own overtime pay practices in the light of the Supreme Court's opinion. He reaffirmed his previously expressed opinion that, except for the longshoring industry, there would not be any significant back-wage liabilities growing out of the decision in the longshore cases. He pointed out that even in the longshoring industry the amount of liability would not be nearly as much as had been feared because of a number of factors. Among these are the fact that most longshoremen have not worked over 40 hours a week for a single employer in any significant number of work weeks, the fact that there is, in most instances, a good-faith defense under that Portal-to-Portal Act insofar as payments for Saturdays, Sundays, and holidays is concerned, and the fact that there is a two-year statute of limitations under the act.

"The essence of the Supreme Court ruling," said Mr. McComb, "is that an employee who receives a higher wage rate because of undesirable hours or disagreeable work is entitled to be paid for work beyond 40 hours in a workweek at time and one-half figured on his actual pay, but that extra pay received for working long hours is not a part of the regular rate and can be credited against the overtime pay required by the Wage & Hour Law."

Stagger Export Applications

A staggered time schedule of dates for submission of license applications covering proposed exports of iron and steel products against third quarter quotas has been announced by Office of International Trade. The new procedure replaces the former practice under which all applications against a quarterly quota were submitted at least two weeks before the first day of the quarter. The staggered schedule of submission dates is designed to provide speedier return of applications and a more efficient method of issuing export licenses against quotas for iron and steel products.

Date for submission of applications for third quarter range through Aug. 5.

Trading with Germany

What American exporters and importers need to know about economic conditions, foreign trade procedures and military government regulations in order to trade with postwar Germany is explained in a 34-page pamphlet just issued by the Office of International Trade, Department of Commerce.

The pamphlet, entitled "Trading with Postwar Germany," is available from the Department of Commerce field offices or the Superintendent of Documents, Washington 25, D C., for 5 cents.

Export and import potentialities of the American and British zones are explained in some detail, with 325 possible exports and about 150 possible imports listed.

Hirsch To Aid Scrap Return

Alfred H. Hirsch, former scrap consultant for the Army Service Forces and head of the WAA scrap division at Cleveland, has been appointed industrial specialist with the Office of Industry Co-operation. He soon will go to Germany to serve as liaison officer with the military government for the purpose of expediting shipment of scrap from Germany to American steel mills.

Industrial Preparedness Pushed

Munitions Board chairman tells Machinery & Allied Products Institute meeting that nation's industrial preparedness assures peace for long time to come

THOMAS J. HARGRAVE, chairman, the Munitions Board, is personally convinced we will not have another major war in the near future.

He made this statement at the annual meeting of the Machinery & Allied Products Institute June 10, at the Mayflower Hotel, Washington. The reason, he said, is that we are too well prepared at present to invite attack. If we maintain and intensify our preparation, he felt sure, we will enjoy peace for a long time to come.

Mr. Hargrave's remarks were of particular significance because his organization has the top responsibility for planning the military aspects of industrial mobilization in support of the strategic and logistic plans of the Joint Chiefs of Staff. To such good effect has the drive to mobilize industry in advance of another war been pushed, that most leading companies, in the number of 11,000 or more, know today what they would be called on to do if a war broke out tomorrow. All other plants will be enrolled in this program within six months to a year, he said.

Tells of Activities — He told about some of the activities now under way. Congress has been asked to authorize an increase in the number of special war plants to be kept intact in a standby condition from the present 151 to 405. Congress, which has authorized the placing of 192,000 military-purpose machine tools in standby has been asked to authorize pickling of an additional 100,000. The machine tool industry has been asked for, and now is working on, a "product" priority plan which will be considered in establishing the basis for machine tool allocation by industries in an emergency.

The three services have a uniform cataloging system which already has been effectuated to an advanced stage. Uniform procurement regulations for the three services should be ready for announcement by Aug. 1. One of the provisions will be purchase by one service of identical goods used by all three.

Foreign Trade Section — A new step by the Munitions Board is creation of a Foreign Trade Section which will sit on the interdepartmental committee that determines whether the Office of International Trade will issue shipping licenses or deny them in the case of individual orders for export. This Foreign Trade Section will look after all military considerations entering into our foreign trade policies.

Another important matter brought to the attention of the members was the rewriting of the famous "green book," the book which designates allowable costs in executing government contracts. C. A. Packard, vice president and comptroller, Worthington Pump & Machinery Corp., and chairman of the MAPI Accounting Council Subcommittee on Contract Cost Principles, reported that if the green book comes out in its present revised state, "I fail to see where the contractor is going to get back all his costs."

Allowable Costs — The items now subject to disallowance in whole or in part, Mr. Packard reported, are: 1—All general selling expenses other than those chargeable to the particular contract, with selling commissions disallowed entirely; 2—royalty payments to an officer or anyone else having a substantial interest in the contractor's business; 3—advertising; 4—contributions to local and other welfare funds; 5—collection expenses; and other items.

Furthermore, the inspectors have too much latitude in determining what costs are allowable. The inspector, for example, may disallow all compensation for spoiled or rejected work.

Instead of the 10 or 12-page statement on policy in the green book, said Mr. Packard, his committee has been trying to get the service officers to adopt this simple policy: A government contractor's cost shall be the sum total of all costs properly chargeable on the same basis as is customary in connection with commercial work.

Rear Admiral Frank Baldwin, chairman of the joint service committee which is rewriting the green book, said that his group will continue to work with Mr. Packard's group and with other groups from industry; the "door still is open for complaints and suggestions," he said. However, it was clear that the bulk of the spadework has been done. Admiral Baldwin's committee is due to make a final report by July 1.

Renegotiation Opposed — Objection to peacetime revival of contract renegotiation (in Public Law 547, which authorized the Secretary of Defense to renegotiate all contracts let in connection with the 70-group Air Force program) was expressed by A. G. Bryant, president, National Machine Tool Builders' Association, and president, Cleereman Machine Tool Co.

"The provision for renewal of renegotiation is not only insidious in its possibilities but typical of the fallacious thinking which leads us to avoid the one thing that will make for efficiency in production, and that is the profit incentive . . . Renegotiation in World War II encouraged inefficiency, put a premium upon delay, and gave no real recognition to initiative, experience and performance," said Mr. Bryant.

British Tool Conscious — Machine tools can be sold to the British, reported James Y. Scott, president, Van Norman Co., but not, as a general rule, the many types of standard tools which have been sold in volume to Great Britain in the past. Rather, there is a good market there for specialized machine tools of high productive capacity which can be placed in in-line production setups. The British are more export minded than ever and welcome machines and methods which will increase their efficiency.

Calendar of Meetings . . .

June 21-25, American Society for Testing Materials: Annual meeting and exhibit of testing apparatus and related equipment, Book-Cadillac Hotel, Detroit. Society headquarters are located at 1916 Race St., Philadelphia.

June 21-25, American Institute of Electrical Engineers: Summer general meeting, Mexico City, Mexico. Institute secretary is H. H. Henline, 33 W. 39th St., New York.

June 28-30, American Foundrymen's Association: Fifth annual chapter chairman conference, Hotel Stevens, Chicago. Society secretary-treasurer is William W. Maloney, 222 W. Adams St., Chicago.

June 28-July 1, American Electroplaters' Society: Annual convention and industrial finishing exposition, Ambassador Hotel, Atlantic City, N. J. Society headquarters are at 473 York Rd., Jenkintown, Pa.

July 16-24, American Road Builders' Association: 1948 convention and road show. Soldier Field, Chicago. Association headquarters are in the International Bldg., Washington.

July 21-23, American Society of Civil Engineers: Summer convention, Olympic Hotel, Seattle.

July 26-27, Institute of Scrap Iron & Steel Inc.: Midyear meeting, Ambassador Hotel, Atlantic City, N. J. Institute executive vice president is E. C. Barringer, Dupont Circle Bldg., Washington.

Aug. 10-13, First Western Packaging Exposition and Conference: San Francisco Civic Auditorium, San Francisco.

Politics Wreck Bizone's Steel Planning Group

DUSSELDORF, GERMANY

REVITALIZATION of the Ruhr's steel industry was given a sharp setback recently when the Anglo-American-German Steel Commission, set up to study methods for increasing steel production, was dissolved. Its dissolution followed a rift in political ideologies between the participating countries.

Focal point of the dispute was Dr. Herrman Reusch Jr., a German representative on the commission. Dr. Reusch, president of Gute Hoffnungs Huette, is the leading German exponent of free enterprise. He is liked and trusted by many of the Americans here, some of whom had had business associations with him before the war. Socialistic-minded British and German trade union men, however, have openly fought him and have protested his serving on the commission.

The trade unions have attacked him as a warmongering heavy industrialist, subservient to the Nazis, and threatened to call a general strike in the Ruhr unless he was fired from the commission. A strike in his own plant was actually called in protest against his appointment to the commission, and pressure was applied on the Bizonal economic council of the Germans to withdraw its support of him in order to avoid a party split which might endanger impending adoption of currency reform measures and frustrate passage of acts broadening co-operation in the European Recovery Program.

Commission Disbanded—The council acquiesced to the trade unions in their demands, and the Allied commanders, rather than dismiss Dr. Reusch outright at trade union instigation and be forced to nominate any successor who would be acceptable to the trade unions, dissolved the commission.

The fight over Dr. Reusch is only one evidence of the intense struggle looming for domination of Germany's steel industry. A plan for reorganization of the industry has been prepared by the trade unions, under which the gains of this group in directing the operations of the independent steel companies formed through deconcentration would be extended and consolidated throughout the industry. The plan envisions formation of an Iron & Steel Administrative Council, as a steel parliament, and an Iron & Steel Administrative Office, as a steel cabinet.

The council would be composed of 12 trade union and 12 industrial association members, with the head appointed by the Economic Council and an additional representative being named by the Economic Administration. This council would have the job of working out the principles and methods for the industry within the framework of economic policy laid down by the government. It is feared it would completely subordinate business and free enterprise principles to political issues.

The administrative office would issue production, price and other managerial directives to steel producers. It would force the industry into a planned economy of the socialist mold.

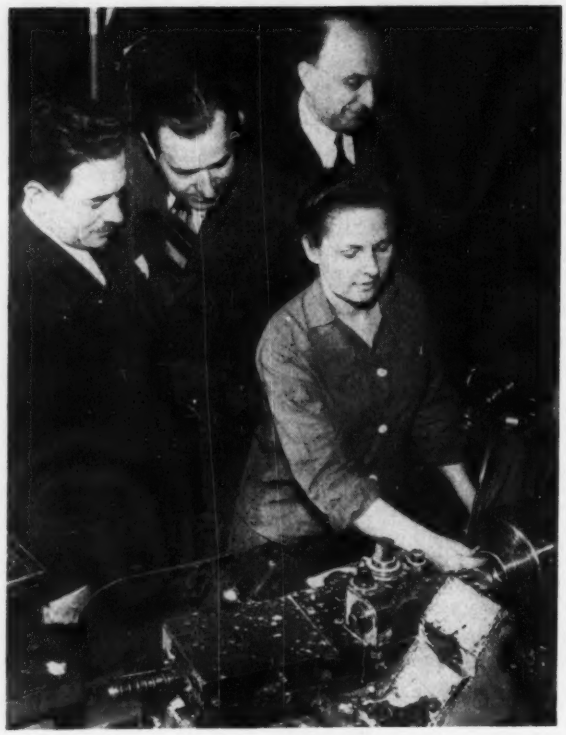
These plans, if carried out, would result in domination of the industry by groups which are not in the majority in the industry. Less than half of all steel workers are now in unions. In many cases only 40 per cent of the workers decide on strikes and have usurped the right to speak for all employees, on strike issues only union members being able to vote. During strikes financial support is given only to members and only members are allowed to perform maintenance work.

Currency Reform in Offing — The long-awaited currency reform is expected by June 27. Its major result, by making only 5 per cent of cash and bank balances eligible for conversion into the new currency, will be to tighten money supply as drastically as possible, thus squeezing all available stocks of merchandise into the market. All prices are expected to be removed from control, and rationing will be eliminated to a large extent. Only bread, meat and fats and clothing and shoes will be rationed. Coal and steel will remain for a short time under a loose allotment system.

The deflationary tendencies of the slash in money supply is expected to provide a great incentive to export, if only for liquidity's sake. Exports even at a loss will be preferable to amassing hoards of goods for which no money is available in the domestic markets.

Such sweeping changes will naturally bring many new problems to business. But it is understood enough money for working capital and salaries will be provided.

The reform will have intense social implications. The propertied class in Germany would be wiped out almost completely. Income in the future will be derived only from work, with income from investments nonexistent at the beginning and rising only as new savings and investments are made. The reform will, however, maintain the German economy in a private enterprise system, governed by the incentives of the free market.



STUDY U.S. METHODS: Three members of a French industrial mission, studying American production and management know-how which can aid reconstruction efforts in their own country, visit the Philadelphia plants of SKF Industries Inc. to observe the fine points of ball and roller bearing manufacture. The mission came to this country at the invitation of W. Averell Harriman, roving ambassador for ERP

Goal Upped as British Steel Output Climbs

BIRMINGHAM, ENG.

MEMBERS of the British government are predicting enactment of a bill nationalizing the steel industry toward the end of this year, despite vigorous protests from all sections of the trade and from within the ranks of the government itself.

Meanwhile, the steel production target for this year had been raised from 14 to 14.5 million tons. Output is still running at an annual rate of over 15 million tons—May's yearly rate having been 15,220,000 tons—and while some decline is expected during the summer, it is anticipated that the target will be exceeded substantially.

In line with the continuing export drive, April's exports of iron and steel reached 614,037 tons, which compared with 592,861 tons in the like 1947 month. Principal exported item was wrought tubes at 93,143 tons, followed by tin plates at 65,611 tons.

Import Trend Varied—To support the high steelmaking rate, increased quantities of pig iron, scrap and iron ore are being brought in from abroad. In April, pig iron imports were 10,784 tons, compared with 1426 tons in the like 1947 month. Scrap imports aggregated 171,148 tons from January through April, compared with 75,210 in the comparable period of last year. The high rate of pig iron production is being achieved by increased consumption of foreign ore, most of which is from Sweden and which in April amounted to nearly 300,000 tons. Imports of semifinished steel to Britain, however, are considerably below what they were a year ago. In April 8400 tons were imported as against 17,019 tons in the like 1947 month, and for the first four months of the year Britain's semifinished imports were 36,119 tons compared with 76,919 in the corresponding period of last year.

As additional steelmaking and blast furnace capacity is brought in under construction programs now in progress, the raw materials problem is expected to intensify. Even now low level of scrap receipts is threatening to cut the ingot rate, and blast furnaces will soon feel the effect of growing competition from Germany for Swedish ore. On the other hand, coke and coal shipments have shown improvement recently.

Facts for Industry . . .

(As reported by government agencies)

Steel Boilers — Orders were booked in April for 1339 steel boilers of 100 sq ft of heating surface and over. Their total surface was 1.6 million sq ft. This compares with March bookings of 1287 boilers with heating surface of 1.7 million sq ft. Of the April total 629 boilers, or 47 per cent, were stationary power boilers of over 15 lb pressure; 697, or 52 per cent, were steel heating boilers, and 13 were marine boilers. Heating surface of the stationary power boilers accounted for 75 per cent of the total. During 1947 orders were placed for boilers with 16.9 million sq ft of heating surface. This represented 8141 stationary power boilers, 7935 heating boilers and 35 marine boilers. *Census Bureau, Commerce Dept.*

Domestic Water Systems—Factory shipments of domestic water systems, including pumps and windmills, in April were 55,188 units valued at $4.3 million. This was a decrease of 11 per cent in number and 9 per cent in value from March shipments. Compared with March, shipments of jet systems were down 15 per cent, non-jet systems 7 per cent, pump jacks 15 per cent and cylinders 18 per cent. Shipments of hand and windmill pumps were up 8 per cent, windmill heads 22 per cent and windmill towers 31 per cent. *Census Bureau, Commerce Dept.*

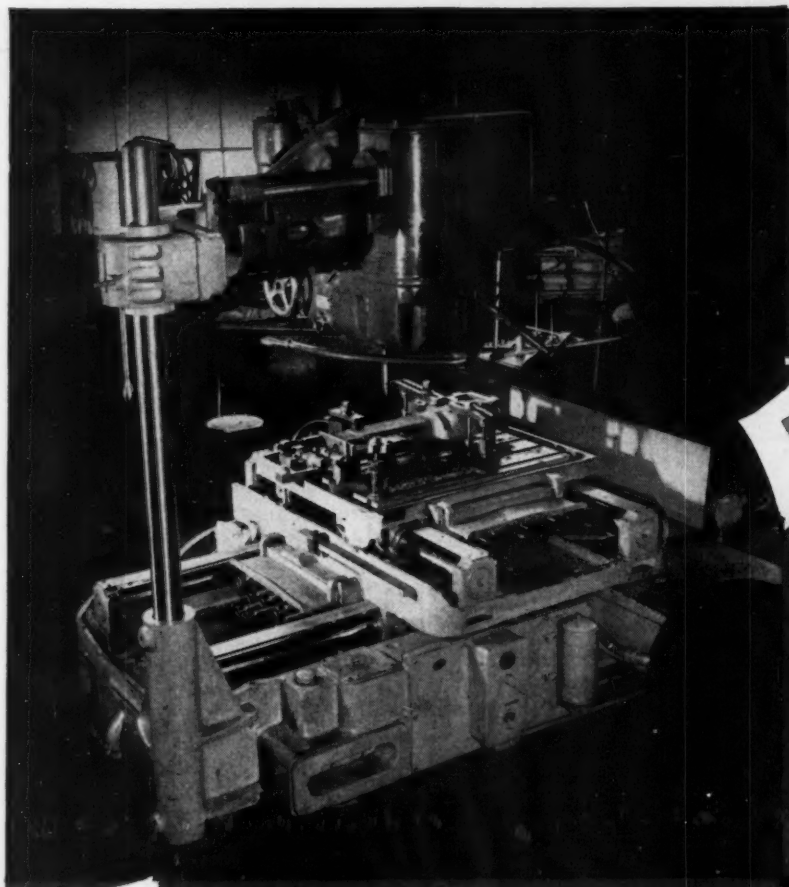
Housing Type Trailers — April production of housing type trailer coaches was 5517 units and shipments totaled 5698 units, with a value of $10.2 million. This was a 17 per cent increase in number and 20 per cent in value over March shipments. Compared with the same month last year, 4 per cent more trailers with 17 per cent greater valuation were shipped. *Census Bureau, Commerce Dept.*

Wrought Aluminum—Shipments of aluminum wrought products in April totaled 138,967,000 lb, and although 13 per cent less than the peacetime peak shipments of March were 26 per cent higher than for the comparable 1947 month. Practically all of the decrease centered in shipments of plate, sheet and strip which totaled 106.7 million lb from 127 million lb in March. The remainder of the April shipments consisted of 15.1 million lb of rolled structural shapes, rod, bar and wire; 16.1 million lb of extruded shapes, tube blooms and tubing; and 1.1 million lb of powder, flake and paste. Not included in the total were 2.2 million lb which were shipped to manufacturers for further processing. *Census Bureau, Commerce Dept.*

Malleable Iron Castings — April malleable iron castings shipments, at 80,602 short tons, were 7 per cent below the peak of 86,767 tons reached in March. Of the total, 45,941 tons, or 57 per cent, were shipped as rough castings to outside trades. The remaining 34,661 tons were for the producers' own use. New orders booked for sale to outside trades in the month amounted to 42,168 tons, 4 per cent under March bookings. *Census Bureau, Commerce Dept.*

Steel Shipping Containers — Production of steel shipping barrels, drums, and pails in 1947 amounted to 27.1 million heavy-type barrels and drums, 8.8 million light-type barrels and drums, and 61.1 million steel packages, kegs and pails. Heavy-type container production was 19 per cent higher than in 1946 and almost equaled the 1943 record of 27.2 million. Production of light-type units declined slightly from the 1946 total, but production of packages, kegs and pails was 10 per cent higher. *Census Bureau, Commerce Dept.*

Heating Stoves—Domestic heating stove production in March was 365,857 units, compared with 351,333 in February. Shipments in the latest month totaled 265,193 units, valued at $6.0 million, compared with 261,925 and $6.5 million in February. Gas heating stoves accounted for 41 per cent of the total output, and kerosene, gasoline and fuel oil stoves for 42 per cent. The remainder consisted of wood and coal-burning stoves. *Census Bureau, Commerce Dept.*



P

1.

2.

AT HEPPENSTALL COMPANY, PITTSBURGH...
PRODUCTION TIME CUT BETTER THAN 36%

Drilling and countersinking 13/16" diameter holes in this chipper knife used to take 95 minutes per piece for layout and drilling. The same job done with a BULLARD 30"x20" Man-Au-Trol Spacer, including setup time, takes only 60 minutes. According to C. W. Heppenstall, Jr., vice-president of this progressive firm, this new hole-locating method is "a real advancement in the science of metal working".

3.

AT R. HOE & CO., INC., NEW YORK CITY...
OVER $2500 IN JIG FABRICATION SAVED IN 3 MONTHS

This maker of fine printing presses not *only* saved time on every job handled by a BULLARD Man-Au-Trol Spacer *but also* eliminated 75 hole-locating jigs in three months for a total saving of $2500 to $3000. Officials of R. Hoe & Co., Inc. further report that plans for constructing one of the world's largest presses for the Philadelphia Inquirer will require practically no jigs because of the use of the BULLARD 30"x20" Man-Au-Trol Spacer.

HOW MUCH CAN YOU SAVE?

Your first step toward learning how much you, too, can save in production time, jig fabrication and worker fatigue is to write for the latest Man-Au-Trol Spacer Bulletin. THE BULLARD COMPANY, Bridgeport 2, Connecticut.

BULLARD
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MASTER OF THE MACHINE

BULLARD CREATES *NEW METHODS* TO MAKE MACHINES DO MORE

By A. H. ALLEN *Detroit Editor, STEEL*

Mirrors of Motordom

Steel shipments to auto industry set alltime record in 1947 at 9,273,000 tons, but car and truck assemblies rank only fourth. Several companies increase prices

DETROIT

AUTOMOTIVE companies last year received a larger tonnage of steel products than ever before, taking 9,273,000 net tons in 1947, compared to the previous record of 8,882,000 tons in 1941.

Despite these record shipments, car and truck production in the United States was only the fourth highest in the industry's history. Total production of 4,799,493 units last year was exceeded in 1929 with 5,358,420, in 1937 with 4,808,085, and in 1941 with 4,838,561 units.

Throughout the year, the chief complaint of auto companies was lack of steel and the year was punctuated by frequent shutdowns to accumulate inventories of steel.

A natural question arises as to why auto production should not have been higher and in line with the record shipments of steel products.

The answer is fairly simple. First, the auto industry was called upon to produce replacement parts at a very high level. Second, an unusually high percentage of 1947 output was trucks, which naturally take more steel per unit than do the lighter passenger cars. Third, postwar passenger car models with their heavier and wider bodies require more steel.

Largest Consumer — The auto industry not only received more steel last year than ever before, but it maintained its position as the No. 1 industrial consumer of the metal, taking 14.7 per cent of the total finished steel shipped. The 9,273,000 tons used by the auto industry includes 8,846,419 tons in direct shipments and 427,000 tons of automotive forgings.

Percentagewise, the auto industry's share of total steel output is somewhat lower than in the better prewar years. In 1929, automakers received 7,114,000 net tons, or 17.57 per cent of total shipments. In 1937, it took 6,553,556 tons, or 20.4 per cent of the total.

Steel shipments still are a major problem for the auto companies and two leading producers, Ford and General Motors, were forced to close their plants recently for lack of material. This is the result of steel mill curtailments during the April coal strike, the effects of which are now being felt in the consuming industries.

Notwithstanding, auto assemblies for the first five months this year are running ahead of 1947; 2,068,867 cars and trucks were assembled in the United States through May this year, compared with 1,952,446 in the first five months last year.

Automobile Production

Passenger Cars and Trucks—U. S and Canada

	1948	1947
January	422,324	366,205
February	399,460	393,636
March	519,126	443,588
April	461,348	445,137
May	355,400*	404,191
June	.....	421,466
July	.....	400,944
August	.....	364,478
September	.....	444,501
October	.....	461,536
November	.....	417,493
December	.....	492,109
12 mos.	.....	5,055,284

* Preliminary.

Estimates for week ended:

	1948	1947
May 29	92,772	79,315
June 5	75,607	98,499
June 12	109,688	97,943
June 19	100,000	102,545

Estimates by Ward's Automotive Reports

Great Lakes Ups Capacity

Telephone of George R. Fink, president of Great Lakes Steel Corp. here, must have started ringing furiously last Monday after the Sunday publication of an exclusive interview in the *Detroit Free Press,* in which he stated his plant hopes to produce 100,000 tons of cold-rolled sheets this month, compared with productive capacity of 60,000 tons monthly at the end of the war. Not only that, by the end of August Great Lakes should be producing cold-rolled at the rate of 120,000 tons a month, and "not long after" the figure will be boosted to 130,000 tons.

It is rarely Mr. Fink cares to make any detailed public disclosure of current and future steel production activity. Last September, after he testified before a Senate committee to the effect annual cold-rolled sheet capacity would be expanded from 700,000 to 1,200,000 tons annually, he was besieged by auto company presidents seeking more body steel. In the latest interview he told Leo Donovan, *Free Press* reporter, "I know I'll be besieged again when this is made public. I'll be glad when we have to go back selling steel again."

A few quick calculations show Great Lakes by fall will be shipping 70,000 tons a month more of cold-rolled sheets than it did three years ago. The average automobile requires about 1 ton of cold-rolled, so this means that an additional 70,000 cars monthly can be produced now, on the basis of steel supplied by Great Lakes alone, and this supplier furnishes roughly 20 per cent of automotive cold sheet requirements, a figure which, incidentally, is being boosted to 25 per cent by the additional capacity. Probably 85-90 per cent of all Great Lakes sheet goes to the automotive industry.

The catch, of course, is that automobiles currently require about 20 per cent more cold-rolled sheets than prior to the war because of wider and heavier bodies and the unprecedented high volume of replacement parts manufacture, so the net gain by virtue of the additional steel tonnage available is not nearly as large as the above figures appear to indicate. In other words, 117 per cent increase in cold-rolled sheet capacity at Great Lakes has raised its share of total automotive body sheet only 5 percentage points.

Equipment most recently added to Great Lakes' facilities cost about $4 million and include two bessemer converters, a continuous pickler and extensions and additions to cold-finishing equipment.

Prices Going Up

Increased wage costs as result of third round adjustments are being accompanied by price advances by some auto makers.

Packard announced price increases of $75 to $200 simultaneously with the granting of a 13-cent hourly wage

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PLAYBOY: Three-passenger convertible model of the Playboy is displayed in New York. This model is scheduled to sell for $985 f.o.b. Buffalo. Photo shows President Louis Horwitz of the Playboy Motor Car Corp. presenting keys to Actress Faye Emerson. NEA photo

increase to the company's employees.

Nash upped prices $75 to $90, while granting a 13-cent wage raise.

Chevrolet raised prices on trucks and commercial vehicles from $45 to $95. Part of this increase is attributed to higher manufacturing costs of new features. No increase in passenger car models is contemplated by Chevrolet at this time.

GMC Truck & Coach Division of General Motors advanced its entire truck line from $10 to $110.

The third round wage pattern appears to be forming around the Chrysler settlement of a flat wage increase in the neighborhood of 13 cents an hour. In addition to those mentioned, Hudson, Briggs Mfg. Co., Kaiser-Frazer and others have settled on this basis. Kaiser-Frazer in addition has substituted a social security plan for its bonus plan.

Tucker Appeals to Public

Preston Tucker, president of the new automobile company bearing his name, is buying full page advertising space in metropolitan newspapers to accuse other auto manufacturing companies and officials in Washington of hampering his efforts to get into production on his new car.

Chief among his complaints was that the War Assets Administration had rejected his bid for a government-owned blast furnace plant in Cleveland, operated by Republic Steel Corp. WAA found both Tucker's bid and one submitted by Republic Steel inadequate.

Late last week the Securities & Exchange Commission petitioned federal court at Chicago to order Tucker to produce its operating and financial records and federal Judge John P. Barnes gave the Tucker Corp. until June 22 to show cause why these data should not be produced. A year ago SEC issued a report saying: "The manner in which funds of the corporation have been administered in certain instances raises some grave questions as to whether a proper stewardship of corporate funds has been consistently maintained."

Tucker, incidentally, is engaged in a novel merchandising scheme. Accessories for Tucker cars are being offered for sale in advance of the car's delivery. Buyers who take sets of accessories costing $230 to $284 can get a factory-confirmed "sequence number" guaranteeing them delivery of cars in sequence of production.

Gasoline Outlook Fair

Prospects for the nation's gasoline supply for this summer and fall "look pretty good" to Max Ball of the Interior Department.

"We feel fairly confident now that, unless the public drives recklessly far and recklessly fast, there will be no actual gasoline shortage," says Mr. Ball.

He added that there may be spot shortages throughout the Midwest due to inadequate transportation and distribution.

Cadillac To Open Branches

To take advantage of the expanding market for fine automobiles in California, the Cadillac Division of General Motors will establish factory sales branches in Los Angeles, San Francisco, Oakland and Pasadena next Jan. 1. California now accounts for 10 to 12 per cent of Cadillac's total sales volume.

Discontinue Fleet Discounts

Ford Motor Co. has terminated its fleet sales agreements under which large buyers of its cars and trucks were given discounts of about 3 per cent if a minimum of 20 vehicles were purchased each year.

Similar action was taken by General Motors two weeks ago.

To Exhibit Old Cars

James Melton, opera and radio singer, will turn his hobby of collecting Stanley Steamers, Duryeas and other ancient autos into a cash-at-the-ticket-window proposition. Some 50 of his 100 old cars will be shown at a museum near Norfolk, Conn., at which the public for a fee may take a peep at the oldtime cars.

According to the Internal Revenue Bureau, Mr. Melton's hobby has not been a total financial loss to date. The bureau has ruled that the singer may deduct his $20,000-a-year hobby as a promotion expense which aids his singing career.

Aircraft Procurement Mapped

Procurement of new naval aircraft has been mapped out under the $653,635,000 authorized for that purpose by the Secretary of Defense from Congressional appropriations. Breakdown by manufacturer and quantity is as follows:

Manufacturer	Quantity
Fighters	
McDonnell	179
Grumman	317
Douglas	28
Chance-Vought	52
	576
Attack Type	
Douglas	356
Grumman	23
Martin	47
	426
Patrol Type	
Lockheed	82
Transports	
Fairchild	8
Grumman	6
Undetermined	2
	16
Helicopters	
Sikorsky	37

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1. WILL COLOR CODING HELP?

Your drawings can be reproduced with black, blue, red or sepia lines on a white or tinted background. Thus, you can color code prints of different departments or operations—speed routing, reduce possibility of error.

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You can make translucent Ozalid Intermediates directly from your tracings . . . and use these as Masters in your printmaking. This eliminates wear and tear on the original . . . also provides Masters for different departments, branches, subcontractors, etc. Ozalid Intermediates are actually better to print from than original drawings—for they increase line densities and can be made on new plastic-coated surfaces . . . impervious to staining and smudging.

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Valuable drafting time is saved with Ozalid. Instead of altering your original . . . you can make your changes or additions on a translucent Ozalid print. New products—like Ozalid Strip Film—with a transparent adhesive base—can be used to transfer title blocks or sections from one drawing or translucent Master to another.

5. WANT TO COMBINE ONE DRAWING WITH ANOTHER?

Assume that you wish to show the details of two or more drawings on one print—here's how easy it is: Make a transparent Ozalid film print of each drawing . . . then overlay these on a sheet of Ozalid sensitized paper and process. You get a composite print—all details exactly as you want them. A big advantage in evaluating floor plans, work layouts, wiring diagrams, etc.

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DEPT. NO. 107

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WAA To Finish Plant Disposals In Midwest

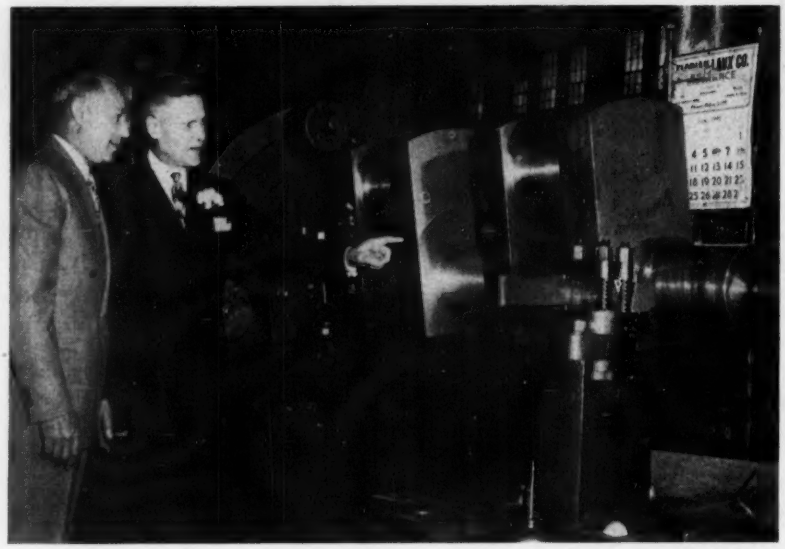
WAR ASSETS Administration has launched a drive to complete disposal of all government plants in the Chicago region, following clarification of the recent "freeze" order on surplus facilities.

Munitions Board has designated some WAA properties for application of the national security clause. Under this clause, the government retains rights in the event of a national emergency to utilize the unit for production under government contract. Both classifications of plants—those subject to and those not subject to the clause—are being offered for sale or lease.

Few on Sealed Bid Basis—Of the total remaining available surplus plants, two Rockford, Ill., factories and part of the Vigo Ordnance Plant, Terre Haute, Ind., are being offered on a sealed bid basis. Other plants are for disposal by negotiation.

The following units are listed according to the former occupant, location and size. Plants not subject to the national security clause include: U. S. Navy, Rockdale, Ill., 700,000 sq ft; Eddy Paper Co., Rockford, Ill., 215,000 sq ft; Sundstrand Machine Tool Co., Rockford, Ill., 116,000 sq ft; Continental Motors Corp., Detroit, 32,400 sq ft; Dow Magnesium Corp., Marysville, Mich., 507,000 sq ft; National Carbon Co., Fostoria, O., 109,600 sq ft; Willys-Overland Motors Inc., Toledo, O., 350,000 sq ft; Commodity Credit Corp., Blooming Prairie, Minn., 28,000 sq ft; Commodity Credit Corp., New Richland, Minn., 28,000 sq ft; and Wells, Minn., 28,000 sq ft; Vigo Ordnance Works, Terre Haute, Ind., 75,000 sq ft.

Plants subject to the national security clause include: Pullman-Standard Car Mfg. Co., Chicago, 38 acres of harbor yards; Chicago Bridge & Iron Co., Seneca, Ill., 195-acre shipyard; Commodity Credit Corp., Galesburg, Ill., 28,000 sq ft; Continental Foundry & Machine Co., East Chicago, Ind., 270,000 sq ft; Commodity Credit Corp., Ripon, Wis., 28,000 sq ft; Continental Aviation & Engineering Co., Muskegon, Mich., 800,000 sq ft; Dow Chemical Co., Bay City, Mich., 105,000 sq ft; Lima Tank arsenal, Lima, O., 85,000 sq ft plus 100-acre test area; Ohio Steel Foundry Co., Lima, O., 158,000 sq ft; Magnesium Reduction Co., Luckey, O., 194,000 sq ft; Willys-Overland Motors Inc., Toledo, O., 467,000 sq ft.



CRANKSHAFT FOR PRESS: Marshall M. Smith, president of E. W. Bliss Co., shows William E. Paris, vice president and director of operations, Willys-Overland Motors Inc., Toledo, the turning of a large crankshaft for a Bliss press to be used in the automotive industry at an open house held in observance of the Bliss company's $1,250,000 Toledo plant expansion

American Great Lakes Ore Fleet Totals 267 Vessels

American Great Lakes ore carrier fleet is seven vessels smaller this year than it was in 1947, the decrease in capacity amounting to 53,400 tons per trip, according to the M. A. Hanna Co., Cleveland. This year's fleet comprises 267 vessels having a capacity of 2,631,550 tons per trip.

Compared with 1947 fleets, Hutchinson & Co. has two fewer vessels, accounting for a loss of 13,100 tons per trip; Browning Steamship Co., two fewer, 10,800 tons; Wilson Transit Co., one less, 7100 tons; Columbia Transportation Co., one less, 10,400 tons; and Boland & Cornelius, one less, 12,000 tons. Of the seven vessels eliminated from the American fleet, three are now under Canadian registry (*Martin Mullen, W. D. Calverley Jr., S. H. Robbins*); two are converted self-unloaders (*John Roen* and *S. B. Way*); two are in miscellaneous trade (*Penobscott* and *Sonora.*) The *Fred L. Hewitt* has been renamed the *Sonoma.*

Pittsburgh Steamship Co. maintains its leadership with 62 vessels, having a capacity of 696,350 tons per trip, and is followed by the Interlake Steamship Co., 36 vessels, 364,900 tons; Hutchinson & Co., 31 vessels, 275,850 tons; Cleveland-Cliffs Iron Co., 17 vessels, 165,500 tons plus 5 WSA vessels, 30,100 tons; Great Lakes Steamship Co., 15 vessels, 139,100 tons; M. A. Hanna Co. (agent), 13 vessels, 139,100 tons; Bethlehem Transportation Corp., 12 vessels, 126,000 tons; and Wilson Transit Co., 11 vessels, 110,000 tons. Other owners have 9 or less ships.

Malleable Founders Elect C. L. Carter President

Collins L. Carter, president, Albion Malleable Iron Co., Albion, Mich., was elected president of the Malleable Founders Society for the coming year at the group's recent 51st annual meeting at Hot Springs, Va. He succeeds Wilson H. Moriarty, vice president of National Malleable & Steel Castings Co., Cleveland.

James H. Smith, general manager of Central Foundry Division, General Motors Corp., Saginaw, Mich., was elected vice president. Four new directors taking office are: John A. Wagner, president, Wagner Malleable Iron Co., Decatur, Ill.; John T. Llewellyn II, president, Chicago Malleable Castings Co., Chicago; Frank O. Parker, vice president, Dayton Malleable Iron Co., Dayton, O.; and H. Nelson Albright, manager, Columbia Malleable Castings Corp., Columbia, Pa.

The society honored Robert R. Fauntleroy, president, Moline Malleable Iron Co., St. Charles, Ill., for outstanding service to the industry.

Briefs . . . .

Paragraph mentions of developments of interest and significance within the metalworking industry

Sam Tour & Co. Inc., New York, engineering and metallurgical consulting firm, has added a glass section to its laboratory.

—o—

S. G. Taylor Chain Co., Hammond, Ind., manufacturer of chain for industrial and automotive use, is this year celebrating its 75th anniversary. E. W. Taylor, a descendant of the founder, is president and general manager.

—o—

American Thermometer Division, Hartford, Conn., Robertshaw-Fulton Controls Co., has sold its Oven Bi-Metal Indicator department to Cooper Oven Thermometer Co., Paquabuck, Conn.

—o—

White Metal Mfg. Co., Hoboken, N. J., manufacturer of metal can spouts and collapsible tubes for pharmaceutical and industrial products, has appointed Cutler Chemical Co., Philadelphia, as its exclusive representative in eastern Pennsylvania, Delaware and Maryland.

—o—

Dearborn Motors Corp., Detroit, marketing organization for the Ford tractor and Dearborn farm equipment, recently demonstrated 45 farm implements, ranging from plows to specialized tools, that have been added to the Dearborn line.

—o—

Securities & Exchange Commission announces that 781 reporting manufacturing corporations had first quarter sales in 1948 of $20,438,179,000, an increase of 21.2 per cent over the corresponding first quarter sales in 1947, but a 1.1 per cent decrease compared with sales in the last quarter of 1947.

—o—

Rheem Mfg. Co., San Francisco, has begun production on a new line of water heaters for all fuels.

—o—

Reed Rolled Thread Die Co., Worcester, Mass., has purchased Cleveland Die & Mfg. Co., Cleveland. Equipment of the Cleveland company will be moved to Worcester this fall.

—o—

Association of Casualty & Surety Companies, New York, has published "Your Guide for the Safe Use of Hand Tools" and "Your Guide to Safety When Blasting."

—o—

Sterling Mfg. Co., Cleveland, manufacturer of instruments for the automotive and other industrial fields, has been purchased by Junius R. Clark, former vice president of Fawick Airflex Co. Inc.

—o—

National Safety Council, Chicago, reports that the national industrial injury rate in 1947, based on the number of disabling injuries per 1 million man-hours, was 13.26, a reduction of 10 per cent from the year before. The communications industry, with a rate of 2.98, had the lowest frequency, followed by the electrical equipment industry with 6.02.

—o—

Babcock & Wilcox Co., New York, reports that its subsidiary, Babcock & Wilcox Tube Co., manufacturer of seamless and welded tubular products, has appointed Industrial Supplies Ltd., Vancouver, B. C., Canada, as its sales agent for British Columbia.

—o—

Martin Quaid Co., fabricator of alloy metals, has completed moving to 1815 W. Sedgley Ave., Philadelphia. All divisions of the firm are now situated at this one location.

—o—

Purdue University will hold a metals casting conference Nov. 4 and 5 on its campus in Lafayette, Ind.

—o—

Die Supply Co., Cleveland, manufacturer of dies, jigs and related products, has appointed Mason, Shaver & Rhoades, East McKeesport, Pa., as its sales agent for western Pennsylvania.

—o—

Max Planck Society for Advancement of Science, named for the German mathematician and physicist who died recently, has been formed to take the place of the Kaiser Wilhelm Institute, which was dissolved because of its Nazi affiliations. Dr. Otto Hahn, Nobel Prize winner, heads the new group.

—o—

Kling Bros. Engineering Works, Chicago, manufacturer of metalworking machinery, has taken over K. W. Atwater Engineering Inc. whose founder, K. W. Atwater, recently died. The Atwater name and address, Investment Bldg., Pittsburgh, remain unchanged. Harry R. Gilchrist will be in charge of the Pittsburgh office.

—o—

Inland Waterways Corp., St. Louis, a government organization which operates the Federal Barge Line and Warrior River Terminal Co., will permanently close its Birmingham office on June 30. Mobile, Ala., office is not affected.

—o—

Dravo Corp., Pittsburgh, has appointed Harry F. Haldeman Inc., Los Angeles, as its southern California distributor for Dravo heaters.

—o—

Redmond Co. Inc., Owosso, Mich., manufacturer of fractional horsepower motors, has purchased Holtzer-Cabot Division, Boston, First Industrial Corp. Holtzer-Cabot, which also produces fractional horsepower motors, will become a division of Redmond.

—o—

E. D. Bullard Co., San Francisco, manufacturer of safety equipment, is this year celebrating its 50th anniversary.

—o—

Westinghouse Electric Corp., Pittsburgh, reports that its Appliance Division plant at Mansfield, O., saves $800,000 annually in recovering leftover steel scrap, crating lumber, paper, paint, solvents and oils.

—o—

Brooks Oil Co., Cleveland, producer of industrial lubricants, has moved its Pittsburgh office to 934 Ridge Ave.

—o—

Pittston Co., Hoboken, N. J., an affiliate of the Chesapeake & Ohio Railway, has taken a sublease and will operate the WYCL mine of Gulf Smokeless Coal Co. in Wyoming county, W. Va.

—o—

Standard Slag Corp., Youngstown, has acquired Barnes Sand & Gravel Co., Sargents, O., and plans to expand the firm's sand operations.

—o—

Carboloy Co. Inc., Detroit, manufacturer of cemented carbide tools, has appointed Bittenbender Co., Scranton, Pa., as its distributor for northeastern Pennsylvania.

—o—

Hupp Corp., Cleveland, is expanding operations to begin production on an automatic cold drink dispenser and a line of home and commercial freezers. Hupp will continue to make its automotive products.

—o—

Pressed Steel Car Co. Inc., Pittsburgh, has organized a Research & Development Division under the direction of H. E. Chilcoat, vice president, with headquarters in Pittsburgh. Twofold purpose of this move is to achieve additional progress in the design of railway freight and industrial cars and to further the company's product diversification program.

The Business Trend

INDUSTRIAL activity in the week ended June 12 pushed to the highest level since February, and reflecting the gains made by all basic indicators in the latest week, STEEL's index of industrial production registered 168 per cent of the 1936-1939 weekly average, 15 points above the level of the previous week.

Insufficient supplies of materials, notably steel, continue to impose ceilings on production of many items, and many of the other important elements of production—labor, power and fuel—remain so short as to preclude any significant upturn in overall output for some time.

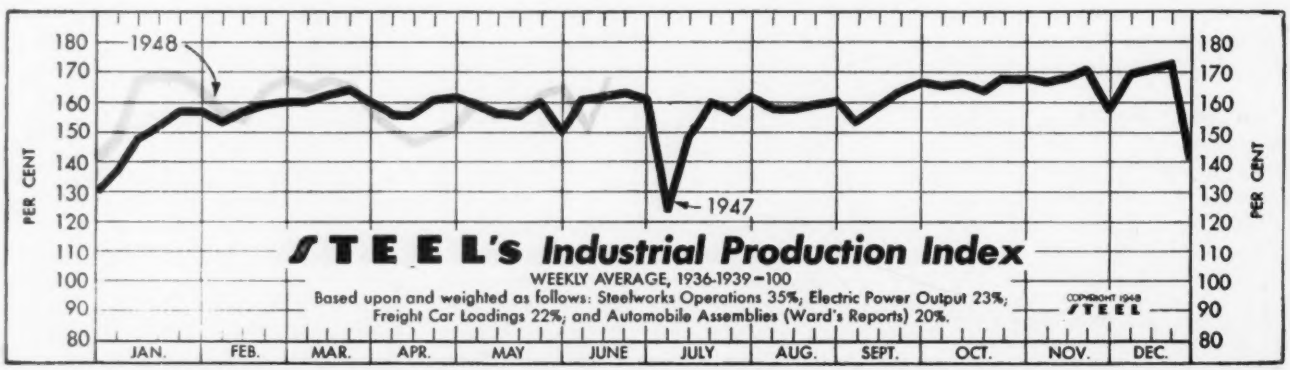
RAW MATERIALS—Growing needs arising out of the preparedness and aid-to-Europe programs are expected soon to tighten supply of many industrial raw materials. A survey by the Purchasing Agents Association of Chicago reveals 61 per cent of reporting companies foresee acute shortages of their raw materials as the result of these programs, but, interestingly, only one out of every three thinks that government control and allocation of short-supply materials will come this year.

STEEL—Despite ingot production in May of 7.6 million tons, a peacetime record for that month, and shipments of finished products in April of more than five million tons, all consuming industries continue to be plagued by the steel shortage. As military and essential domestic requirements rise, it seems inevitable that other users will get less.

AUTOS—The automotive industry, although ranking as the leading industrial recipient of finished steel, has suffered periodic output curtailments since the end of the war as the result of lack of steel. Model change-overs and strikes have had beneficial effect in permitting of stocks replenishment, but last week General Motors' Michigan fabricating and assembly plants were closed for want of steel and its facilities in other areas are expected to be similarly affected as certain inventories are used up. Before this curtailment, in the week ended June 12, the industry's production zoomed to the pre-coal strike level, nearing 110,000 units.

COAL—With all industry extremely conscious of the havoc wreaked by the coal mine shutdown of March and April, contract negotiations are being watched closely for a hint as to what to expect next week when the current contract expires. As a consequence of the last strike, April production of coke fell 21 per cent below the March level and bituminous coal and lignite stocks held by industrial consumers and retail dealers decreased 21 and 16 per cent, respectively.

INCOME—Pushed up by increased prices and marketings of agricultural commodities, personal income in April rose $1.4 billion to an annual rate of $209.1 billion, according to the Office of Business Economics, Department of Commerce. Aggregate wage and salary disbursements, however, declined for the third consecutive month to the lowest level since November, with the decline centered in manufacturing.



Index (chart above): Week ended June 12 (preliminary) 168 Previous Week 153 Month Ago 159 Year Ago 162

BAROMETERS of BUSINESS

INDUSTRY	Latest Period*	Prior Week	Month Ago	Year Ago
Steel Ingot Output (per cent of capacity)†	96.0	95.5	94.5	96.5
Electric Power Distributed (million kilowatt hours)	5,132	4,845	5,109	4,702
Bituminous Coal Production (daily av.—1000 tons)	2,163	2,302	2,114	2,222
Petroleum Production (daily av.—1000 bbl.)	5,479	5,476	5,423	5,113
Construction Volume (ENR—Unit $1,000,000)	$174.1	$135.0	$149.2	$158.1
Automobile and Truck Output (Ward's—number units)	109,688	75,607	83,275	97,943

* Dates on request. † 1948 weekly capacity is 1,802,746 net tons. 1947 weekly capacity was 1,749,928 net tons.

TRADE				
Freight Carloadings (unit—1000 cars)	895†	821	847	895
Business Failures (Dun & Bradstreet, number)	110	91	100	66
Money in Circulation (in millions of dollars)‡	$27,864	$27,895	$27,762	$28,253
Department Store Sales (change from like wk. a yr. ago)‡	−4%	+19%	+6%	+7%

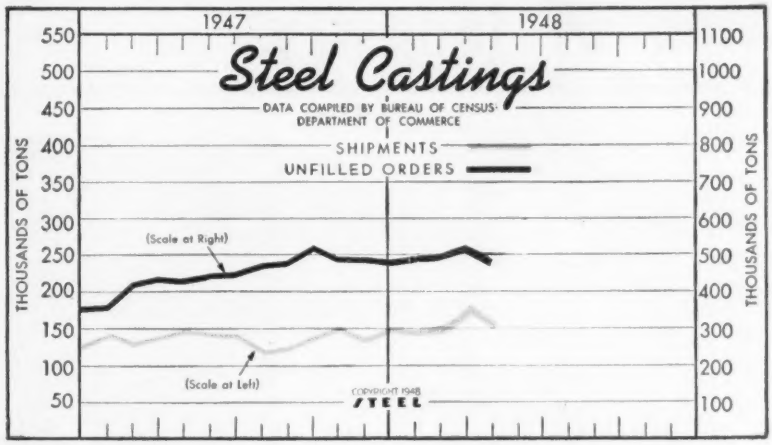
† Preliminary. ‡ Federal Reserve Board.

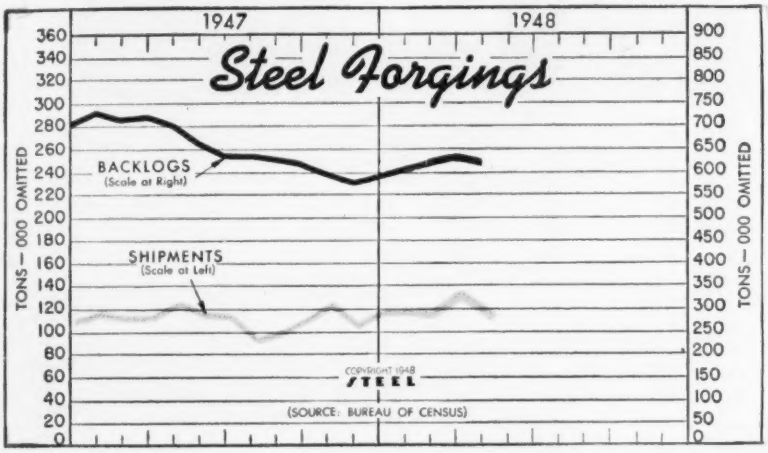
Commercial Steel Castings

(Net tons in thousands)

	Shipments 1948	Shipments 1947	Unfilled Orders* 1948	Unfilled Orders* 1947
Jan.	141.1	139.0	491.7	365.5
Feb.	142.4	125.6	497.1	421.4
Mar.	162.9	134.9	508.8	434.9
Apr.	150.3	144.2	472.4	427.6
May	....	140.9	....	443.2
June	....	139.0	....	445.5
July	....	117.0	....	473.9
Aug.	....	120.4	....	478.6
Sept.	....	137.4	....	526.2
Oct.	....	148.4	....	497.3
Nov.	....	130.1	....	493.3
Dec.	....	148.1	....	489.4

* Castings for sale.





Steel Forgings

(Tons—000 omitted)

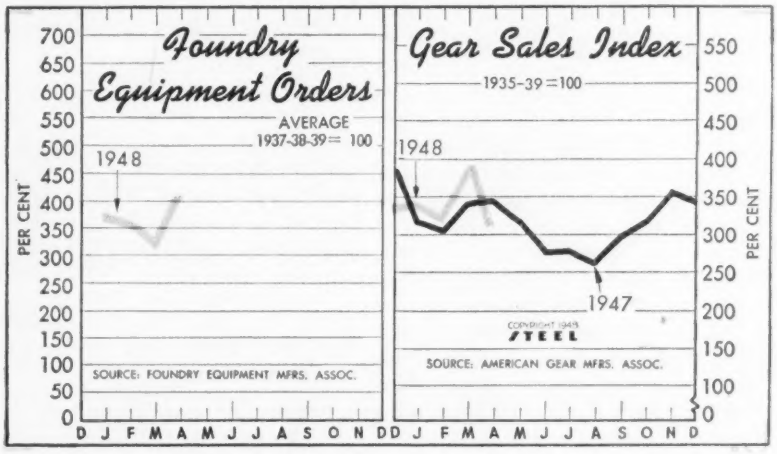
	Shipments* 1948	Shipments* 1947	Unfilled Orders* 1948	Unfilled Orders* 1947
January	118	116	618	723
February	117	111	631	714
March	131	115	641	717
April	114	121	628	699
May	...	115	...	663
June	...	110	...	638
July	...	92	...	631
August	...	98	...	626
September	...	109	...	617
October	...	124	...	594
November	...	104	...	586
December	...	117	...	594

* Forgings for sale.

Foundry Equipment Orders* / Gear Sales

	Foundry Equipment Orders* Index (1937-38-39=100) 1948	Gear Sales Index (1935-39=100) 1948	Gear Sales Index (1935-39=100) 1947
January	380.9	346.8	317.0
February	367.3	324.4	303.0
March	326.2	389.8	342.9
April	412.0	320.9	346.2
May	....	....	317.2
June	....	....	278.0
July	....	....	278.5
August	....	....	261.6
September	....	....	297.7
October	....	....	317.7
November	....	....	356.9
December	....	....	343.6

* By foundry trades only.


Foundry Equipment Orders
AVERAGE 1937-38-39= 100
1948
PER CENT
SOURCE: FOUNDRY EQUIPMENT MFRS. ASSOC.
Gear Sales Index
1935-39=100
1948
1947
PER CENT
COPYRIGHT 1948 STEEL
SOURCE: AMERICAN GEAR MFRS. ASSOC.
D J F M A M J J A S O N D D J F M A M J J A S O N D

FINANCE

	Latest Period*	Prior Week	Month Ago	Year Ago
Bank Clearings (Dun & Bradstreet—millions)	$13,088	$11,752	$12,899	$12,841
Federal Gross Debt (billions)	$251.8	$251.9	$252.2	$257.4
Bond Volume, NYSE (millions)	$27.7	$15.3	$28.5	$15.6
Stocks Sales, NYSE (thousands)	7,542	5,003	13,174	4,560
Loans and Investments (billions)†	$62.9	$63.1	$63.1	$62.9
United States Gov't. Obligations Held (millions)†	$35,218	$35,237	$35,640	$38,536

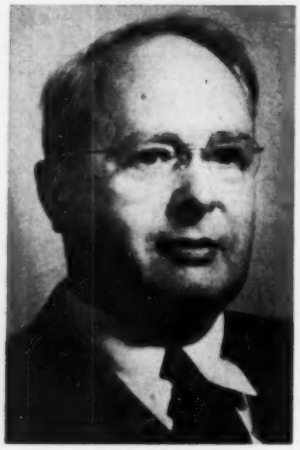
† Member banks, Federal Reserve System.

PRICES

STEEL's composite finished steel price average	$80.27	$80.27	$80.27	$69.82
All Commodities†	164.2	164.4	161.9	147.9
Industrial Raw Materials†	180.9	180.8	175.1	161.8
Manufactured Products†	158.6	159.1	157.6	142.9

† Bureau of Labor Statistics Index, 1926=100.

Men of Industry



A. PRICE DRUMMOND

WALTER L. SCHNEIDER

ALLAN W. WALTER

Because of the magnitude of engineering research involved in present and future activities, Niles-Bement-Pond Co., West Hartford, Conn., is rearranging and broadening its engineering facilities to keep pace. Niles includes two divisions in West Hartford: Pratt & Whitney and Chandler-Evans, plus a wholly-owned subsidiary, Potter & Johnston Co., Pawtucket, R. I. As first move in establishing the broader engineering coverage, **Paul Mueller,** formerly Pratt & Whitney machine tool engineering head, has been relieved of those duties so as to devote full time to engineering research. He will be associated with **Milton Chandler,** engineering head of Chandler-Evans Division. **A. Price Drummond** has been appointed manager of engineering in the Machine Tool Division. He will be responsible for the administration of the machine tool engineering department, and the technical development of the Pratt & Whitney machine tool engineering program. Since 1924 Mr. Drummond has been with National Carbon Co. of Cleveland, as machine development engineer.

—o—

Marvin S. Bandoli has been appointed vice president in charge of sales, Tracy Mfg. Co., Pittsburgh, the appointment to be effective July 1. He will head the sales program for Tracy customized kitchens, a complete line of steel kitchen cabinets with Tracy sinks in stainless steel. For a period of time Mr. Bandoli was with Nash-Kelvinator, having been national sales manager of the Kelvinator Division. Until recently he has been president, Bandoli-McIntyre Co., Los Angeles, appliance distributors in southern California, and prior to the establishment of that business, he was vice president in charge of distribution and a director, Victor Adding Machine Co., Chicago.

—o—

Walter L. Schneider, vice president, Falk Corp., Milwaukee, has been elected president, American Gear Manufacturers Association. He has been active in AGMA affairs for a number of years, and has, for the past year, served as the association's vice president.

—o—

Monorail Manufacturers Association, New York, announces election of **E. J. G. Phillips,** director of engineering, Richards Wilcox Mfg. Co., Aurora, Ill., as president, and **A. F. Anjesky,** sales manager, Cleveland Tramrail Division, Cleveland Crane & Engineering Co., Wickliffe, O., as vice president of the association. **E. Donald Tolles** was re-elected secretary.

—o—

Herman H. Pancake has been appointed manager, American Car & Foundry Co.'s newly created Mine Car & Special Products Sales Division, a consolidation of the Mine Car Sales and Miscellaneous Sales Divisions. Mr. Pancake's increased jurisdiction comes upon the retirement of **H. D. Distelhurst,** formerly manager, Miscellaneous Sales Division, after 43 years of service with American Car & Foundry Co.

—o—

A. B. Muskett has been appointed vice president in charge of manufacturing of General Electric X-Ray Corp., division of General Electric Co., at Milwaukee. Prior to his advancement, Mr. Muskett held the post of manager of manufacturing, and before joining this division in 1947, was manufacturing consultant in General Electric's executive department. For many years, Mr. Muskett was associated with General Motors Corp., Detroit, and the Ford Motor Co., Highland Park and River Rouge plants, in executive capacities. Other appointments in General Electric X-Ray Corp. are: **R. R. Roberts,** named administrative assistant to the executive vice president; **E. Dale Trout,** appointed technical assistant to the marketing manager; and **Adolph Rebensburg,** appointed administrative assistant to the marketing manager.

—o—

Allan W. Walter has been appointed financial vice president, Liquid Carbonic Corp., Chicago. He had previously been with Magnavox Corp. serving in a consulting capacity. Prior to that he held the position of comptroller, Freeport Sulphur Co., assistant comptroller, Firestone Tire & Rubber Co., and financial assistant to the president, W. T. Grant Co.

—o—

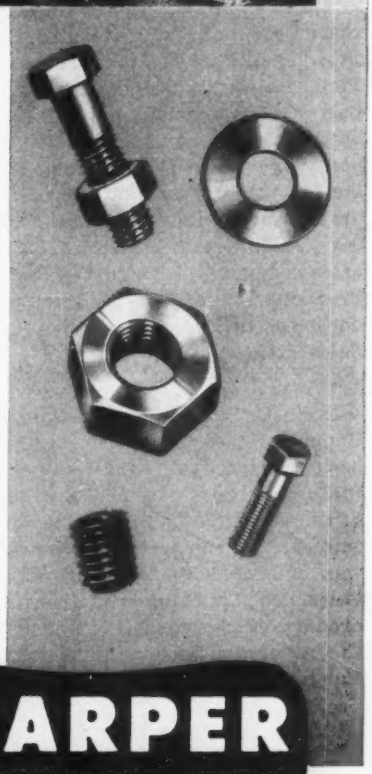
Earl N. Graf and **Walter C. Anderson** have been appointed to newly created sales positions, American Steel & Wire Co., U. S. Steel Corp. subsidiary. Mr. Graf will serve as director of wire rope sales for the eastern district of the United States, and Mr. Anderson as director of construction material sales for the same district. **George H. Cruttenden** has been appointed assistant manager, construction material sales, in the New York sales office.

—o—

R. V. Schageman has been appointed Chicago district sales manager for McConway & Torley Corp., Pitts-

non-ferrous and stainless

fastenings



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burgh, manufacturer of carbon and alloy steel castings and railroad specialties. He succeeds the late **J. J. Hughes,** with whom Mr. Schageman has been associated for more than 25 years as a sales representative in the mid-western area.

—o—

Leland - Gifford Co., Worcester, Mass., has appointed **Jefts G. Beede** as sales engineer of the Boston territory, which includes eastern Massachusetts and northern New England.

—o—

Bruce F. Linck has been appointed sales promotion manager, Elastic Stop Nut Corp. of America, Union, N. J. He has been associated with the sales department since 1943. For about two years he managed the Detroit sales office, and more recently acted as assistant to the general sales manager.

—o—

Paul L. Dragon, formerly supervisor of industrial relations, Columbia Steel Co.'s Pittsburg, Calif., plant, has been appointed assistant director of industrial relations in the San Francisco general offices of the company. **J. D. MacArthur** succeeds Mr. Dragon at Pittsburg, and **I. E. Vredenberg** has been named assistant supervisor.

—o—

Robert B. Paysee, formerly sales manager, Popular Price Lines Division, has been promoted to assistant general sales manager, Ekco Products Co., Chicago. Before the war Mr. Paysee had been Premium Division sales manager for the company. In 1942 he left Ekco sales staff when the company devoted its production to the war effort. During the war years he headed his own sales company. He returned to Ekco Products Co. in 1947 to develop the newly created Popular Price Lines Sales Division.

—o—

Earle C. Smith, chief metallurgist, Republic Steel Corp., Cleveland, has been selected by the trustees of Ohio State University as the 1948 recipient of the Benjamin G. Lamme medal for eminence in engineering. The medal was presented by President Howard Bevis. Mr. Smith also has been honored by other organizations, including the American Society of Mechanical Engineers, and Case Institute of Technology.

—o—

Harvey M. Snook, assistant supervisor, Cost and Statistics Division, Tennessee Coal, Iron & Railroad Co., Birmingham, has been elected assistant comptroller, same division. He succeeds **Joseph B. Cooper,** who has become associated with U. S. Steel Corp. of Delaware, as division chief industrial engineer, basic standards.

—o—

Dr. B. S. Clark, director of research, American Can Co., Maywood, Ill., has been elected president of the Associates of the Food & Container Institute of the Armed Forces, a new organization which will serve as a clearing house for policy decisions concerning research required for the benefit of industry and the armed forces.

—o—

Russell E. Ebersole has been appointed general manager of lamp sales for Westinghouse Electric Corp., Bloomfield, N. J., and **Harold G. Cheney,** as assistant manager of lamp sales. Mr. Ebersole succeeds **William J. Massey,** who retired after 50 years with the company's Lamp Division. **Romus Soucek** has been appointed sales manager of the Aviation Gas Turbine Division at South Philadelphia, Pa., succeeding **G. A. Hyland.**

—o—

Ferro Enamel Corp. announces promotions of **G. L. Bruton** to assistant sales manager, and **E. C. Davidson** as manager of the northern and central Ohio, western Pennsylvania and northern West Virginia territories of the company.

—o—

Jones & Laughlin Steel Corp., Pittsburgh, announces discontinuance of its hot rolled bar sales department, and appointment of **J. W. Robinson** as manager of sales, hot rolled products. The functions of the hot rolled bar sales department, formerly managed by Mr. Robinson, have been absorbed in the hot rolled sales department. **A. A. Wagner,** formerly manager of sales, hot rolled products, has been appointed special assistant to the vice president-sales, and assigned to duties in Washington.

—o—

J. M. Barry, vice president and general manager, Alabama Power Co., Birmingham, has been named to the board of Edison Electric Institute.

—o—

Holsey C. Simpson has been appointed production manager, Dumore Co., Racine, Wis., to supervise production operations of the Industrial, Hobby & Appliance Division. He has been with the company since 1942.

—o—

Leonard J. Edwards, for many years field sales manager for General Alloys Co., Boston, has been appointed New England sales representative for industrial electric heat treating and hardening furnaces produced by C. I. Hayes Inc., Providence, R. I., where Mr. Edwards will maintain headquarters.

—o—

Barney N. Dagan has been named superintendent of the open-hearth department at the Kaiser steel plant in Fontana, Calif., Kaiser Co. Inc., Iron & Steel Division. Mr. Dagan, who has been with the Kaiser organization since July, 1946, was promoted from the position of assistant open hearth superintendent. He is succeeded in that position by **William F. Bowers Jr.**

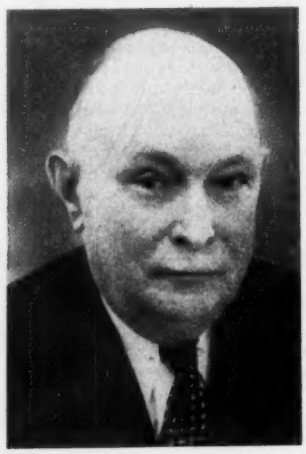
—o—

J. C. Carr has joined the Burndy Engineering Co. Inc., New York, as sales promotion manager. He formerly was advertising and sales promotion manager, Square D Co.'s Kollsman Instrument Division.

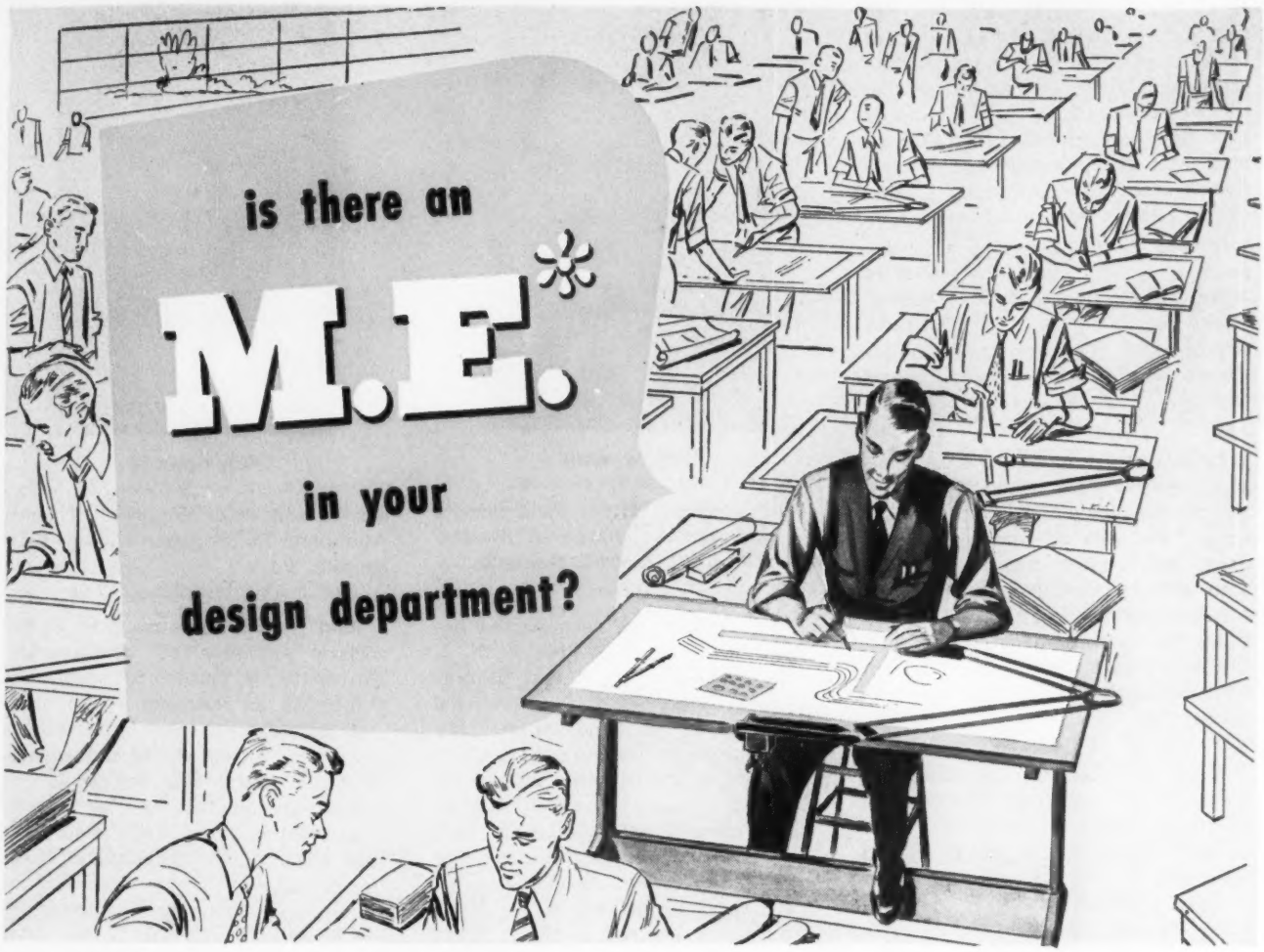
—o—

Ross C. Cornish, general consulting engineer, has joined Gas Machinery Co., Cleveland, as consulting engineer. Mr. Cornish has been connected with the gas business over 50 years. For 16 years he was chief engineer, American Gas Co., in charge

J. W. ROBINSON



ROSS C. CORNISH



You may have an M.E. and not know it! Seek him out! Encourage him to let himself go! Here is what you may gain:

(1) The greatest jump on competition you've ever scored, with a product that's *modern—pounds* lighter at no extra cost. Or, (2) new savings in production, with castings that require only one machine cut from as-cast to finish! Or, (3) in the case of a heavy product, castings that can be *handed* through production instead of *trucked* or *hoisted*. And with all of these advantages, a dependable source for high-quality castings that will be delivered with no delays, in whatever quantity you need them for *full* production.

These are all tangible, proved benefits that other manufacturers have gained when their M.E.'s got a hearing. If you haven't an M.E. on your staff, we'll send one of ours. ALUMINUM COMPANY OF AMERICA, sales agent for American Magnesium products, 1721 Gulf Building, Pittsburgh19, Pa. Sales offices in principal cities.

***M.E., in this case, means Magnesium Enthusiast, and Mechanical Engineer, as well. He's probably young, may have joined you after the war. He knows from experience the powerful appeal of American Magnesium Castings: 75% lighter than iron, 35% lighter than aluminum, machinable at high speed to a superlative finish. He knows the economics of magnesium, which makes his recommendations practical.**

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SUBSIDIARY OF ALUMINUM COMPANY OF AMERICA

of engineering and operation of gas and electric plants. After purchase of American Gas Co. by United Gas Improvement Co., he was assistant to the vice president in charge of engineering development. Mr. Cornish was later chief engineer of Semet-Solvay Engineering Corp.

—o—

Donald L. DeLand has been appointed export manager, Mid-West Abrasive Co., Detroit and Owosso, Mich. Coincident with Mr. DeLand's appointment is the removal of Mid-West's Export Division from Detroit to the main office in Owosso.

—o—

E. E. Bauer has been named manager, central sales district, Peerless Pump Division of Food Machinery Corp. He will be located at Chicago. He formerly had been centrifugal pump sectional sales manager for Peerless Division. **Frank W. McCann** has been named to the position formerly held by Mr. Bauer, and will be located at the Peerless plant at Quincy, Ill.

—o—

Roger W. Rodgers has been appointed sales manager, Sheet Metal Specialty Division, Follansbee Steel Corp., Pittsburgh. He previously had been with Woodall Industries Inc., industrial fabricator, where he was sales manager for the Chicago area, as well as merchandise manager for various fabricated products of this company. Mr. Rodgers is filling the vacancy occasioned by the recent election of **R. K. Follansbee** as secretary and treasurer of the corporation.

—o—

Donald H. Lyons, purchasing agent, Johns-Manville Corp., has been elected president of the Purchasing Agents Association of New York. Other officers elected are: **G. W. Howard Ahl,** Columbia Ribbon & Carbon Mfg. Co., and **Charles O. Minot,** A. H. Bull & Co. Inc., vice presidents.

—o—

Standard Transformer Co., Warren, O., announces appointment of **W. J. O'Brien** as its representative for Tennessee. Mr. O'Brien has been operating consultant for Ebasco Services Inc., New York, and prior to that was president, Memphis Power & Light Co.

—o—

Charles W. Sawyer has been appointed director of styling, Lustron Corp., Columbus, O., manufacturer of porcelain enamel, all-steel homes. Mr. Sawyer had been in charge of the special projects in the Division of Styling, Chrysler Motors, and from 1943 to 1944 was chief graphic engineer, General Motors Field Service Division, and in charge of illustrations for Army aircraft manuals.

FRED W. ROTH

—o—

Fred W. Roth has been elected vice president in charge of Trenton, N. J., plant operations for Gould Storage Battery Corp., subsidiary, National Battery Co., St. Paul, Minn. Mr. Roth was works manager of the Trenton plant of the Storage Battery Division of Philco Corp. when that division merged with Gould in 1947. He joined Philco in 1933 as a member of the accounting section, and became chief accountant of the Storage Battery Division in 1938. When the plant was moved from Philadelphia to its new location in Trenton in 1941, Mr. Roth was made office manager.

—o—

John W. LeDuc has been appointed vice president, Castaloy Corp., Detroit. He has held positions of principal responsibility ranging from superintendent to vice president at the Ford Motor Co., Tucker Aircraft Corp., Emerson Electric Co., Hughes Aircraft Co., Fairchild Engine & Aviation Co., Simmons Aerocessories. He most lately operated his own consulting and production engineering firm identified as John W. LeDuc & Associates.

—o—

Construction Products Corp., Lynwood, Calif., announces appointment of **Fred Schneller** to the newly created position of eastern sales manager, with offices at 5515 Bulwer Ave., St. Louis. Formerly with Aerco Corp. of Hollydale, Calif., he joined Construction Products Corp. in October, 1947, as a member of the western sales staff.

—o—

Richard L. Templin has been elected president, American Society for Testing Materials, Philadelphia. Mr. Templin is assistant director of research and chief engineer of tests, Aluminum Co. of America, New Kensington, Pa.

PAUL DONHAM

—o—

Paul Donham has resigned as associate professor of management, University of Toledo, to accept appointment as manager of commercial development for Morton-Gregory Corp., Toledo, O. In this capacity Mr. Donham will engage in the future development of the Nelson Stud Welding Division of the corporation, which is now centering all manufacturing and development work in Lorain, O. Prior to enlistment in the Navy in World War II, Mr. Donham was associated with American Steel & Wire Co. in various capacities in Cleveland, and Worcester, Mass., and subsequent to Navy service, he was associated with Owens-Corning Fiberglas Corp. as assistant service manager.

—o—

Dr. George Sachs, director, Research Laboratory for Mechanical Metallurgy, Case Institute of Technology, Cleveland, has been appointed director, National Metallurgical Laboratory, Jamshedpur, India. He will assume his new duties October, 1948.

—o—

Carl E. Staninger has joined Alex Gordon and James P. Kinney, Michigan and northwest Ohio representatives for Automatic Transportation Co., Chicago, as a partner and vice president. The new firm, at 410 Stephenson Bldg., Cass at West Grand Blvd., Detroit, is called Gordon, Kinney & Staninger Inc. Mr. Gordon retains the position of president. Until recently, Mr. Staninger was district manager of Clark Equipment Co., a firm he is leaving after 28 years.

—o—

E. H. Mollman has been appointed to the sales and service staff, Return Bend Division, Ohio Steel Foundry

EARL A. GARBER

Elected vice president and general manager, Harbison-Walker Refractories Co., Pittsburgh. Noted in STEEL, June 14 issue, p. 80

ALFRED W. WARD

Who has been elected chairman of the board, Brooks Oil Co., Cleveland. Noted in STEEL, June 14 issue, p. 80

WALTER C. HEMINGWAY

Elected president of U. S. Steel Corp. subsidiary, Pittsburgh Steamship Co., Cleveland. Noted in STEEL, June 14 issue, p. 82

Co., with headquarters in Lima, O. For 20 years Mr. Mollman has been with the Key Co., East St. Louis, as chief engineer, Chicago sales representative, vice president and works manager.

—o—

LaMotte T. Cohu has been elected president and general manager, Consolidated Vultee Aircraft Corp., San Diego, Calif., and also becomes a member of the board of directors, succeeding **V. C. Schorlemmer,** resigned.

—o—

Harry R. Gilchrist has been appointed Pittsburgh manager, K. W. Atwater Engineering Inc., Chicago.

—o—

C. R. Osborn, vice president, General Motors Corp., and general manager of its Electro-Motive Division, La Grange, Ill., has been awarded an honorary degree of doctor of science by the University of Cincinnati, of which he is an alumnus.

—o—

William A. Hunt has been appointed manager of the Kansas City sales office of United States Steel Supply Co., U. S. Steel Corp. subsidiary. A salesman in the St. Louis district for the past several months, Mr. Hunt was formerly with Carnegie-Illinois Steel Corp.

—o—

Bayard D. Kunkle has been elected a member of the board of General Motors Corp., New York, and also of the corporation's Operations Policy Committee. Mr. Kunkle is vice president and group executive in charge of overseas and Canadian operations.

—o—

Louis C. Breetz has retired from Youngstown Sheet & Tube Co., Youngstown, after 46 years' service. Since 1923 he has been assistant superintendent of maintenance, electrical, at Brier Hill Works.

—o—

Kennametal Inc., Latrobe, Pa., manufacturer of cemented carbide tools, has added the following men to its staff of application engineers: **W. L. Chambers, Kenneth Twombley,** and **Conrad R. Seim,** working out of the Chicago office; **Gerald Transue,** working out of the Philadelphia office; and **Ralph Pearce,** working out of the Pittsburgh office. **Gerald Bogner** has been appointed engineer and representative working out of the New York office. He formerly had been on the staff of application engineers at the company's Cleveland office. **Delmar Baker,** formerly an application engineer, has been appointed engineer and representative, working out of the Chicago office.

—o—

Uri B. Grannis Jr. has been appointed manager, equipment sales, American Brakeblok Division, American Brake Shoe Co., New York. Since 1935 Mr. Grannis has served in various sales capacities with the company. He will be located at the division's headquarters in Detroit.

—o—

Vincent J. Schaefer, scientist connected with the research laboratory, General Electric Co., was awarded the honorary degree of doctor of science by Notre Dame University at its 103rd commencement exercises.

OBITUARIES . . .

Frank M. Hardiman, 58, general manager, Harrison Radiator Division, General Motors Corp., died June 11 in Buffalo. He became affiliated with Harrison Radiator Co., Lockport, N. Y., in 1916. He was made president and general manager of this company in 1927, and retained the general managership when the concern became a division of General Motors Corp.

—o—

Charles E. Underwood, 63, superintendent, Coke Oven Division, Bethlehem plant, Bethlehem Steel Co., Bethlehem, Pa., since 1916, died June 13. He had been in the coke and gas business since 1901.

—o—

Henry T. Irwin, president, Rosedale Foundry & Machine Co., Pittsburgh, died recently after a long illness. He had been associated with the Rosedale company for the past 40 years.

—o—

James A. Powell, chief mechanical engineer, Stone & Webster Engineering Corp., Boston, died June 9. He was a designer of steam power plants. Mr. Powell had been associated with Westinghouse Machine Co., Pittsburgh, H. P. S. Keller, Raleigh, N. C., W. P. Barstow Management Association and the Elliott Co. In 1933 he became vice president and assistant chief engineer, E. M. Gilbert Engineering Corp., and in 1938 vice president, Utility Management Corp. He joined Stone & Webster Engineering Corp. in 1941.

—o—

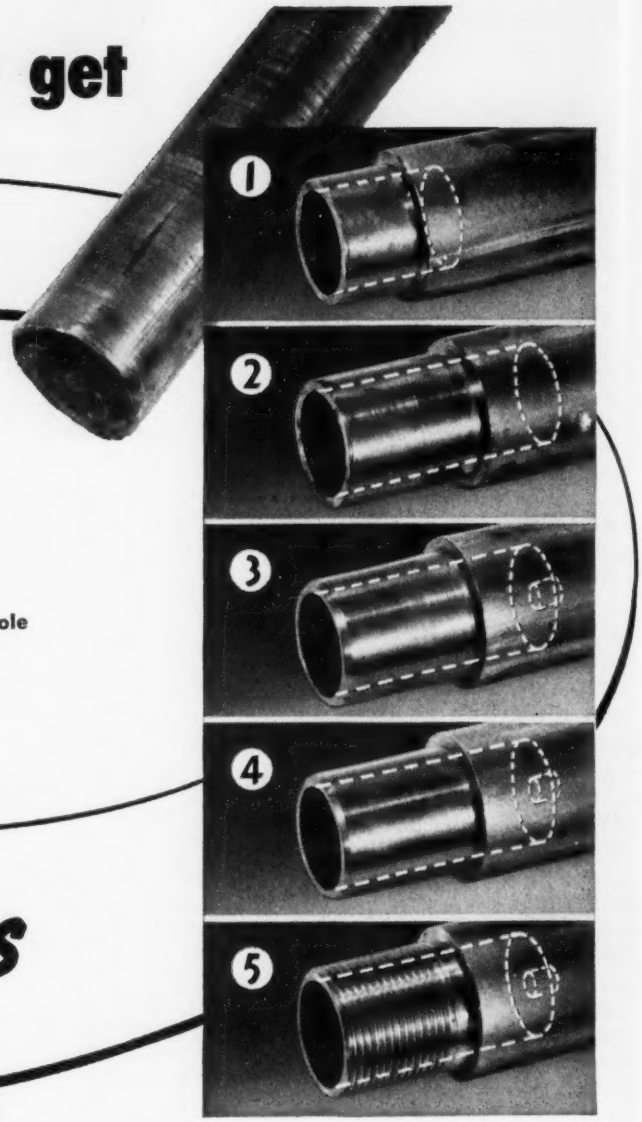
Ben Coplan, 51, who had been associated with Max Schlossberg Co., Chicago, scrap broker, died suddenly June 3.

—o—

Whitney G. Case, 92, retired director and president, W. A. Case & Son Mfg. Co., Buffalo, died June 12 in that city.

How else could you get

FROM THIS



1 Start 1" hole; rough-turn thread diameter part way
2 Finish 1" hole; complete turning thread diameter
3 Drill ⅜" hole; chamfer and face end
4 Finish-turn thread diameter; finish-form base of 1" hole
5 Cut threads
6 Cut off finished plug

TO THIS

in only 14.7 seconds?

This lightning-arrester plug is formed from a length of S.A.E. 1020 steel bar stock in an automatic, six-stage operation—in less than a quarter of a minute! *Cycle-time used to be a minute and a half!*

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Engineering News . . . AT A GLANCE

ELIMINATES IRREGULARITY CAUSES— It is now possible to replace carbon in the surface of decarburized steel within five points of the base carbon of the parts being treated when using the latest atmosphere pit type furnace developed by Lithium Co., Newark, N. J. Furthermore, it allows carburizing at the rate of 0.020-inch for the first hour, and 0.010-inch thereafter up to 0.125-inch total depth of case. The company reveals that the furnace eliminates atmosphere variables which cause irregularities in carburizing or heat treatment results. Designed for operations up to 2000° F, it also provides uniform heating under predetermined, automatically-controlled conditions for annealing, neutral hardening, cycle annealing, normalizing and descaling.

CUTS FIRE HAZARD— Fire hazards created by the rupture of high pressure hydraulic lines now may be eliminated with the use of water base fluid developed by scientists at the Naval Research Laboratory, Washington. Wide usage of the fluid is expected in connection with both military and civilian aircraft. The Navy depends on hydraulic fluids for such needs as large hydraulic systems on aircraft carriers, operation of anchor hoists, large caliber guns, dive flaps in subs, elevators, ship steering mechanisms and equipment for handling torpedos. CAA is now testing the so-called hydrolube fluids for commercial airline use.

MASTER OF ALL JOBS— Such diverse operations as milling keyways, faces, splines, gears and threads; drilling, reaming, boring, routing, grinding—external and internal cylindrical taper and flat surface—and tool grinding, may be performed by a machine tool unit now being produced by Versa-Mil Co., New York. According to the company, the attachment may be combined with a wide variety of standard machine tools to aid the functions of precision operations. With such machine tools as planers, boring mills, etc., the unit eliminates handling time and simplifies setup as the work piece can be retained on a single machine for a series of operations. Large castings mounted on a planer, for example, may be planed, then milled, drilled and ground without moving the attachment from the planer bed.

ANTI-CRACK TECHNIQUE— Outer ring and top plate are welded together on top of a new magnet currently manufactured by Ohio Electric Mfg. Co., Cleveland, thereby placing the weld in a position where it cannot be cracked or damaged by frequent blows against the outer ring. The unit is now being produced in diameters of 39, 55 and 65 inches.

DOUBLED-BARRELED MISSION— Besides acting as a wetting agent to distribute oil film, a pre-lubricant developed recently by AP Parts Corp., Toledo, O., for machinery and other parts, acts as a lubricant itself during time the regular oil film is ruptured. In the product, consisting of synthetic colloidal graphite in alcohol and carbon tetrachloride, electrically charged particles of graphite are so microscopically fine that they form a mere breath-like film when adhered to metal. It is so fine that it takes about 18,000 separate particles to surround a human hair. As a pre-lubricant it reduces surface tension of metal, allowing friction generating surfaces to retain a thicker film of oil and, because of its affinity for metal, it adheres to all surfaces it contacts. It is reported ideal for drawing dies, instruments etc.

QUESTIONABLE PERFORMANCE —There does not appear to be a general agreement as to the quenching ability of molten salt baths, according to F. R. Morral, American Cyanamid Co., after reviewing the molten media quenching situation. Quenching ability, he points out, appears dependent on the bath composition. It is improved by agitation, and the austenitizing temperature as well as the quench temperature is effective on the hardness which can be imparted to a steel. (p. 92)

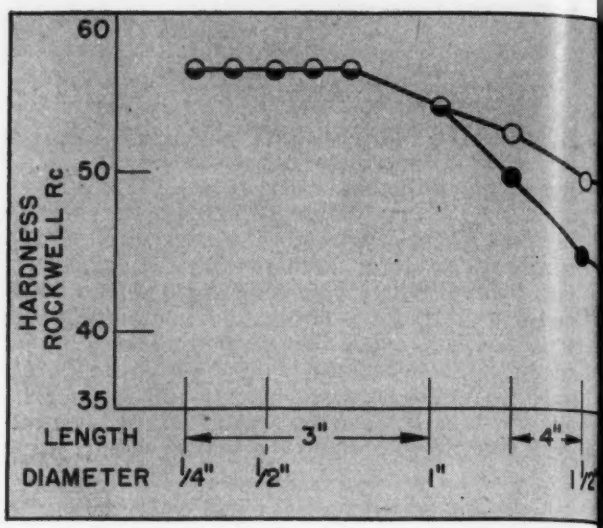
COST AND METAL REDUCER — New forging technique developed by National Machinery Co., Tiffin, O., is really a rolling operation done on a press — one that prepares blanks with accurately reduced sections, distributing the stock to meet requirements of final forging. Chief advantages of the method are said to be reduced scrap loss, increased die life and higher production rates. Dies used are reported to be the same as those regularly utilized for producing similar work on a hammer. (p. 96)

METAL FLOW IN FORGING—Although laws of metal flow are fairly simple, applying these laws practically to produce various shapes of metal forgings in various types of metal compositions is not always quite so simple. For example, if a simple cylinder is upset, allowing metal to flow in any direction it desires, the metal will spread out evenly in all directions to form a disk. If the hot cylinder did not lose any heat except through natural cooling, and if there were no friction between the dies of the hammer and the faces of the cylinder, then the flattened disk would have straight sides just as the cylinder did before it was forged. However, other factors enter the picture. (p. 98)

MORE COVERAGE, LESS FINISH— Acid resistance along with higher reflectance and greater hiding power are among the many advantages offered users of titanium enamels. As a result, the weight of enamel applied on many types of products is now greatly reduced. Formerly, for instance, an additional coat was necessary over the first three ground coats in order to obtain an acid resistant finish. With titanium enamels, such an application is not necessary. Other properties of the finish enable it to be used on products that are subject to scratching, abrasion and impact. (p. 108)

Quenching Steel

IN MOLTEN MEDIA



Cooling characteristics and "H" values of various molten quench salts and interpretations of "U" curves for quenched steels are summarized in this ear-to-the-ground type report

By F. R. MORRAL
American Cyanamid Co.
Stamford, Conn.

HARDENING of steel requires: 1. Heating steel to a temperature above the critical in order to transform its structure to that of stable austenite; 2. cooling at the necessary rate, that is, "quenching" to convert the austenite to whatever structure is desired. Both of these processes may be accomplished in suitable molten salt baths.

Critical cooling rate for thin steel pieces may be taken from time-temperature-transformation diagrams. Many of these diagrams, known also as isothermal diagrams, have been compiled and are available.[1] In the commercial heat treating of steel it is often desired to know how thick a piece of a steel, of a given diameter and cross section, may be hardened to the center. This information can be obtained for some steels from U curves and for a given heat of steel from its Jominy data. U curves give the hardness for various sizes of rounds. Most of those available are for water and oil quenching; only a few have been published showing data for quenching in molten salts, Figs. 1, 3 and 4.

Feszcenko-Czopiwski[4] showed the effect of austenitizing temperature on the resulting hardness on quenching into baths at various temperatures. The 0.6 per cent carbon steel (0.64 per cent C, 0.50 per cent Mn, 0.35 per cent Si, .022 per cent P and 0.018 per cent S) ¼-inch thick was quenched in salt baths between 250 and 400°C (480-750°F). The low temperatures consisted of water salt solutions. These early interesting results are reproduced in Fig. 4.

Shepherd[5] showed how the Jominy data might be used to determine maximum or critical bar diameter (in inches) for carbon and medium alloy steels. He used 50 per cent martensite at the center as the criterion. A vertical is dropped from the steel's carbon content to the critical hardness curve of either the alloy steel or carbon steel, as the case may be. From there a horizontal is drawn to the Jominy curve. At the intersection a vertical was dropped to the center cooling rate in either still water or still oil. A horizontal to the right gives the diameter which will harden to 50 per cent martensite at the center.

Shephard gave data which showed that for certain steels, the relationship between carbon content, critical hardness, center cooling rate and critical bar diameter may be only approximate for oil and salt quenches.

A transparent slide could be made to contain the 100 per cent martensite line which is common for both carbon and alloy steels, the critical hardness curves, for medium and carbon steels, the center cooling rate for still water quench, still oil and possibly of other quenching media, and thus have a tool to use with Jominy curves, when available for the steel which it is desired to harden.

H values indicating the quenching power of a given medium have been calculated. Hollomon and Jaffe[6] have calculated the H value for a salt bath at 400°F. (Table I). The steel was austenitized at 1650°F to obtain these data. Hollomon and Jaffe in their book show a relationship between Jominy values and critical diameters and H values.

International Nickel Co.[8] recently published an adapter. A table which gives approximate average

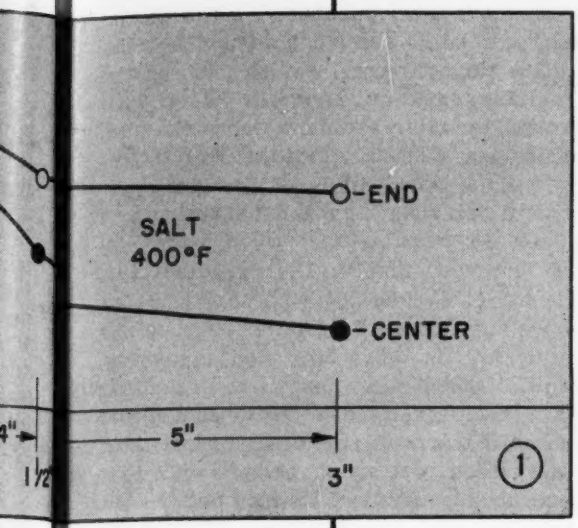


Fig. 1—End and center hardness of rounds of NE 874 quenched in salt at 400° F from 1500° F

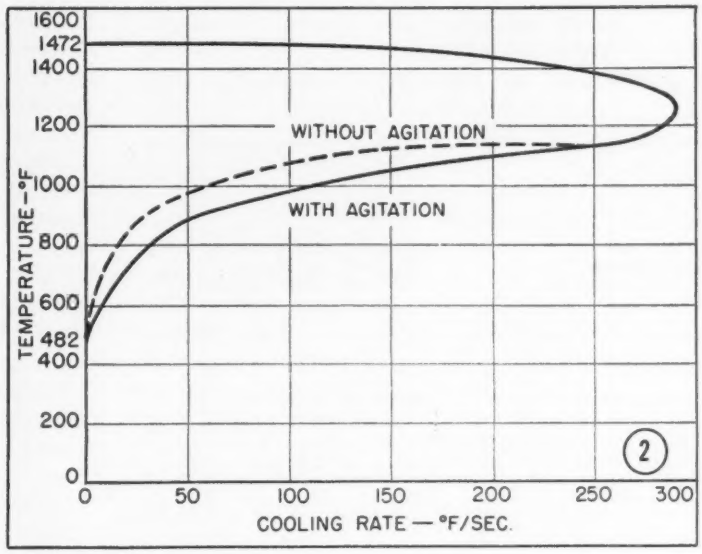


Fig. 2—Effect of salt bath agitation on cooling rate according to Schalbroch et al.

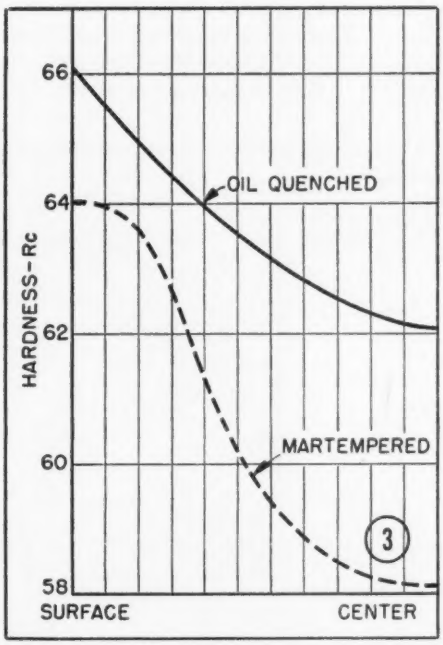


Fig. 3 — Hardenability of SAE 52100 oil-quenched compared to martempered; 1⅜-inch outside diameter test piece, 2 inches long, austenitized at 1550° F, quenched in agitated salt at 475° F

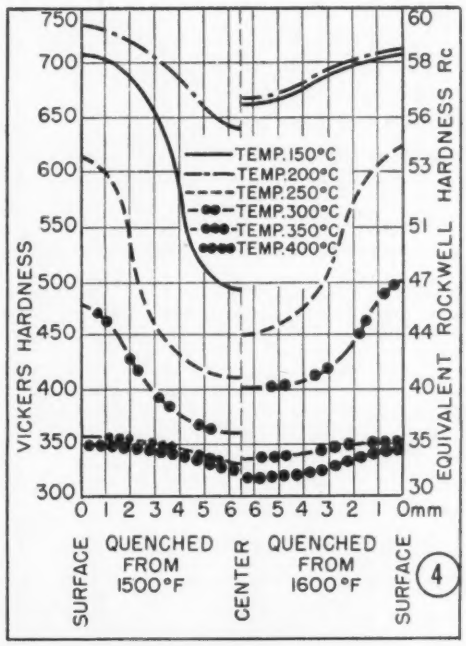


Fig. 4—"U" curves upon quenching from two austenitizing temperatures into salts at 250° C to 400° C; test piece ¼-inch thick

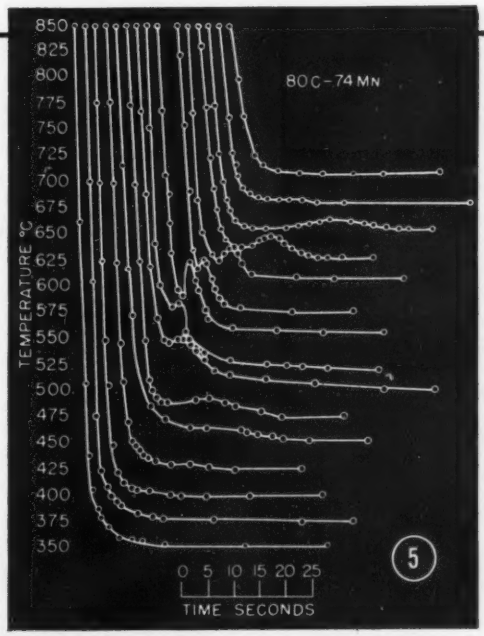


Fig. 5—Cooling curves for 0.26-inch diameter cylinders of plain carbon eutectoid steel quenched in lead baths at various temperatures

cooling rates between 1300 and 1000°F for round steel bars between 1 and 12 inches is used together with T-T-T diagrams and the adapter. With these three tools it is possible to predict the structure which will result when rounds between 1 and 12 inches are quenched in any one of the three cooling media, i.e. water, oil and air.

Cooling properties of water, oil and miscellaneous

salt solutions have been extensively studied and discussed.[9, 10] However, data on molten salts and molten metals as quenching media are scarce. Gensamer et al[7] have published cooling curves for a 0.26-inch diameter cylinder of plain carbon eutectoid steel quenched into lead baths at various temperatures, Fig. 5.

Many articles have been published on the advantages of using salt baths for austenitizing, austempering and quenching purposes, not to mention the well-known use for tempering of steels. Their suitability is proved by their extensive industrial use. Their properties, as quenching media, will be reviewed below. No detailed study of the history of molten salts used for quenching and tempering was made.

It is noted, however, that in 1891 a patent was granted to Brown (U.S. 468,740) who used KNO_2 at 900°F for annealing. In 1904 Le Chatelier[12] mentions the use of nitrates for quenching and tempering. Thomas[13] in 1931 called attention to the fact that quenching in a nitrate salt bath (between 300 and 400°F) produced a martensite of smaller size which was less brittle although of equal hardness with that obtained on quenching in water. He also pointed out that 1 per cent moisture in the salt increased the hardness penetration on a thick plate, or produced brittleness on a thin plate. He noted, moreover, that the increased moisture could be made to reach a concentration where the effect of a salt quench could be similar to that of a water quench. This has been con-

TABLE I
"H" VALUE EQUIVALENTS

Salt bath	H equivalent (in.$^{-1}$)
no agitation	still oil (H-.30)
violent agitation	still water (H-1.0)

TABLE II
Salt Quenching Steel to Martensite (4-inch cubes)

C	Mn	Si	Cr	W	V	Co	Mo	Ni	Austenitizing temp. °F.*
0.85	0.40	0.30	4.5	18	1.5	10.	1.5		2370
0.95	0.40	0.30	5.0	20	2.0		1.5		2200
0.30	0.40	0.30	4.0	12					2010
0.35	0.40	0.25	4.0	10					1830
0.40	0.40	0.25	13.	1					2100
0.70	0.35	0.25	0.5			0.75			1650
0.38	0.50	0.25	1.5					4.5	1560
1.5	0.35	0.25	0.5	5	0.5				1470
0.16	0.45	0.25	1.5					4.5	1470
1.25	0.35	0.25							1470
1.10	0.50	0.25	2.5						1470
1.75	0.50	0.25	1.5						1470
0.95	1.5	0.25	0.5						1470
1.65	0.35	0.25							1470

* Salt quench bath at 400° F.

TABLE III
HARDNESS OF HEAT TREATED STEELS

Steel	Size inch	Austenitized °F	Salt quenched	Hardness R_c Oil q.	Hardness R_c salt q.	Ref.
1020	⅜ OD	*	350 °F	60	62	20
3115	½	*	350	63	62	
4615	½	*	350	60	60	
8620	¾	*	350	63	63	
9420	¾	*	350	63	62	
1045	1	*	350	37	38	
Meehanite	?	1575	500–1 min.	534BHN	555	21
GA			530–30′		444	
X4130	.4 x .4	1575	500–10′	45.5	29.5	22
4140	.4 x .4	1575	500–10′	52	48	
X4340	.4 x .4	1575	500–10′	54	49	
Drill rod	¼	1550	350–5′		65	
	½				52	
	1				43	
	1½				42–5	
SAE 52100	1 x ¼	1⅛ oz.**	350–5′		65–66	
	1 x ⅜	2⅔ oz.			60–63	
	1 x ½	1.1 lb.			60–65	
	1 x ⅞	3 lb.			51–55	

Notes: * Carburized 2 hrs at 1650° F, case depths approx. 0.025 in. (20)
** Weight of part.

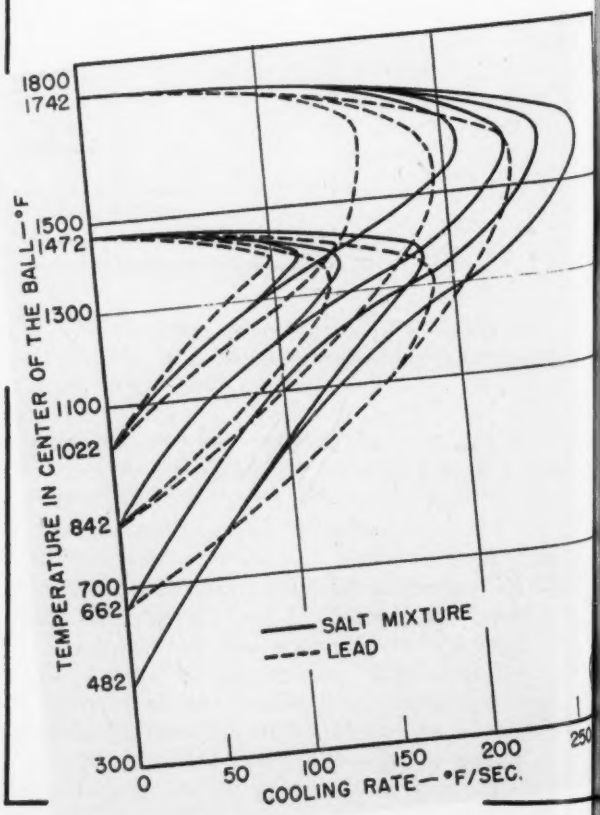
TABLE IV
SIZE LIMITATIONS TO THE AUSTEMPERING PROCESS(18)
STEEL COMPOSITION IN WEIGHT PER CENT

Type	C	Mn	Cr	Ni	Mo	Hardness ceiling in R_c	Max. diameter of round (or equivalent square) in inches
	1.15						0.45–0.3*
	.95–1.05	.3–.5				57–60	0.148
		.6–.9				57–60	.187
	.80–.90	.3–.5				55–58	.156
		.6–.9				55–58	.218
C1059	.60–.70	.6–.9				53–56	.187
C1062		.9–1.2				53–56	.281
		1.6–2.0				53–56	.625
A4063	.65–.75	.75–.95			.25	53–56	.625
	1.00	.4–.6				57–60	.312
4150	.45–.55	.7–.9	.8–1.1		.25–.15	52	.500
5365	.6–.7	.5–.8	.5–.8	1.5–2.0	.3–.4	54	1.0 or larger
	.29	.21	1.45	3.25		49	1.125**

Notes: * After F. C. Thompson, Iron and Steel Inst., 1944.
** Loring, Trans. AIMME, 1942.

Fig. 6—Cooling rates of molten media according to Lueg and Pomp

Fig. 7—Cooling rates of various quenching media according to Lueg and Pomp (curves 1, 2, 3 and 5) and Schallbroch et al. (curves 4, 5 and 6)



firmed later by a study of cooling rates by Schallbroch and co-workers[14].

Lueg and Pomp[15] made a study of the cooling power of oil, lead and salt baths. Fig. 6 summarizes their data translated into English units. A ½-inch Si-Cr-Al steel ball, heat resistant and with no transformation characteristics, was austenitized at 1742°F and 1472°F and quenched to various temperatures. It may be noted that the maximum cooling rate can be changed with the temperature gradient between the austenitizing temperature and the quench temperature.

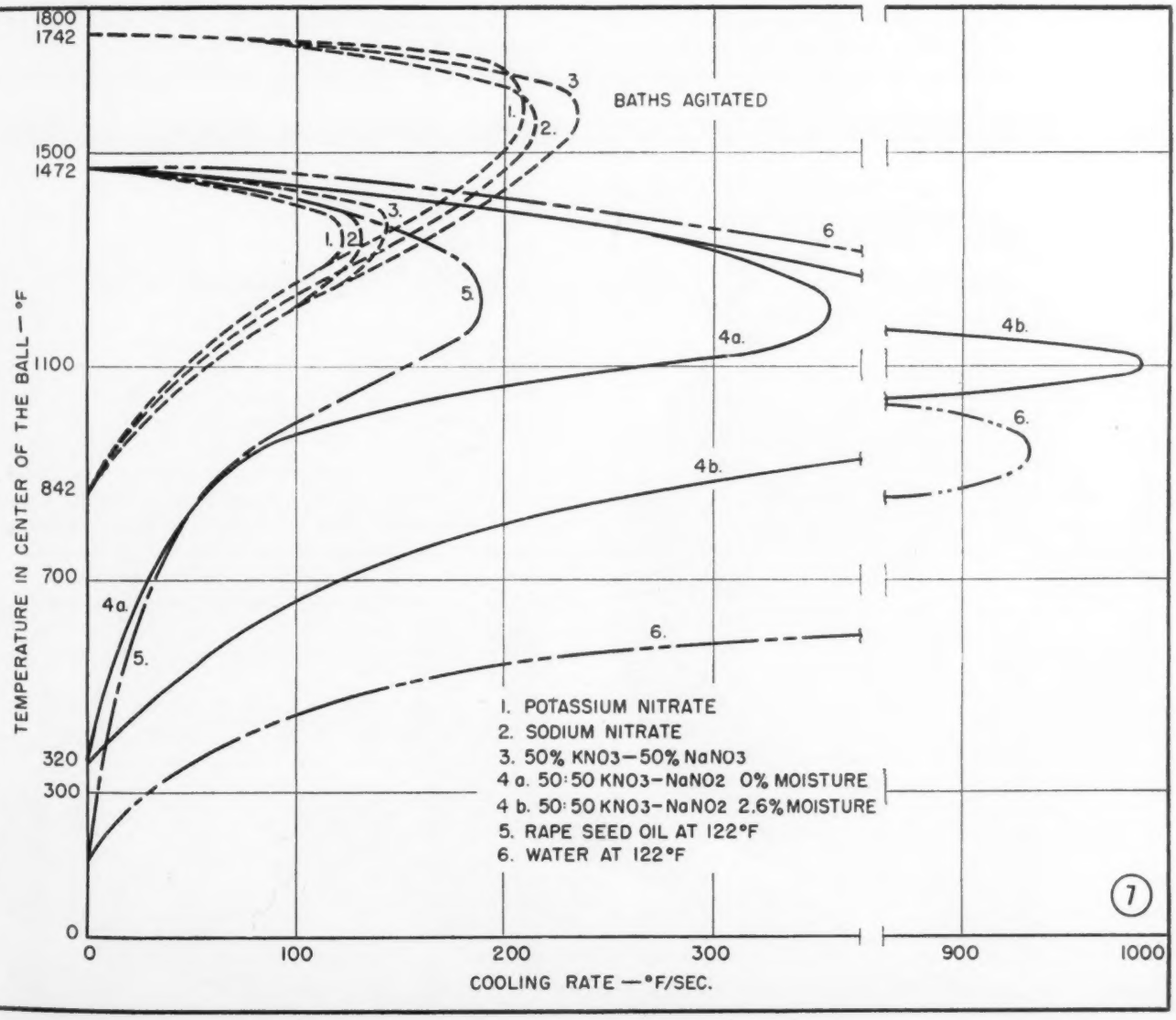
Schallbroch, Bieling and Blank[14] have also studied the cooling power of various quenching media. Their data are replotted in Fig. 7 and compared with that of Lueg and Pomp[15] and three different types of molten salt quenches, Nos. 1, 2 and 3. Schallbroch et al. quenched a silver ball (0.79-inch diameter) from 1472°F to the salt bath at 320°F.

W. Peter[17] using the same technique of the silver ball, 1472°F austenitizing temperature and 320°F quenching temperature and the same salt bath, 4a, Fig. 7, obtained the maximum cooling rate of approximately 480°F per second at 1380°F. In another paper,[18], Peter is credited with the statement that the cooling rate of a salt bath with a 1 per cent moisture content is twice that of the water-free molten salt. As the water content increases further, the cooling power is the same as that of the water-free salts to 2 per cent. This does not agree with the data that is given by Schallbrock et al, see Fig. 7.

Effect of agitation of a salt bath has been studied by Schallbrock[14] and also by Lueg and Pomp[15]. Data by the former appear to conform with industrial experience, and better hardening is obtained in the temperature range needed to avoid the pearlite nose.

In conclusion, there does not appear to be a general agreement as to the quenching ability of molten salt baths. It appears, however, that it is dependent on bath composition; it is improved by agitation, and the austenitizing temperature as well as the quench temperature are effective on the hardness which can be imparted to a steel. It is necessary to obtain new data on molten salt baths to permit a more extensive as well as a more scientific use of their good characteristics in modern heat treating.

In 1934, Fabian[16] was already interested in determining the steels which could be hardened to martensite in molten salts (*Please turn to Page* 116)



Seen and Heard in the

Machinery Field

By GUY HUBBARD
Machine Tool Editor

HONORS FOR LOUIS MARTIN: An unassuming man who has done much more than most people realize to make better movie cameras and better projectors and better mechanisms of many other kinds—through better fine pitch gearing—stood up before a large gathering of top flight gear people at Hot Springs, Va., on June 8, and received well-merited recognition.

Ever since his graduation from Cooper-Union, Louis D. Martin, gear engineer, Eastman Kodak Co., Rochester, N. Y., has devoted his life to the betterment of gear design and manufacture. He did so with Brown Lipe Gear Co., with General Motors Corp., and for the past 22 years with Eastman Kodak. Louis is one of those engineers whose hands are just as nimble as his brain. His ability to do things as well as to dream things has won wide respect not only in his own shop but also in the shops of people who make the machines and tools used in gearmaking.

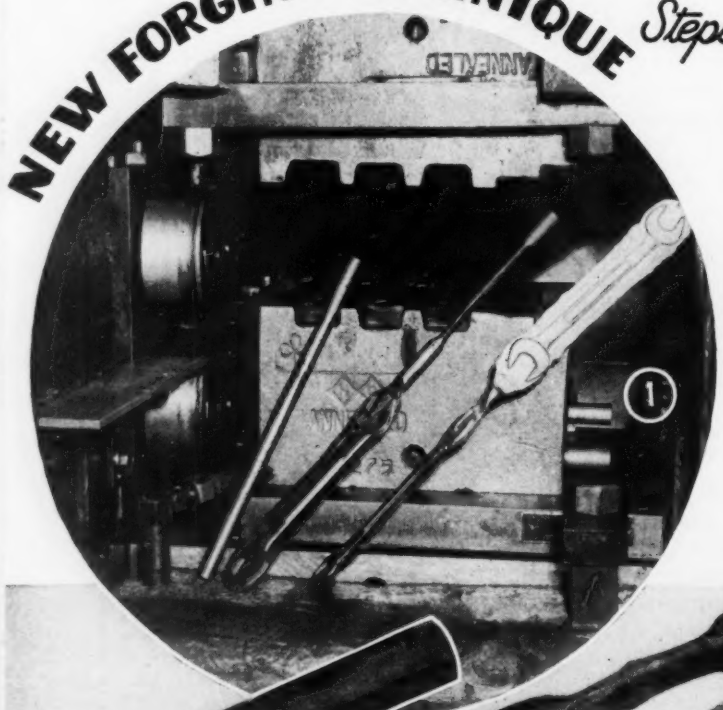
When Louis received the Connell Award at the annual dinner of the American Gear Manufacturers' Association for his fine achievements in fine pitch gearing, he demonstrated still another ability not too common among engineers. After expressing regret that he did not have the eloquence of Demosthenes, he expressed his appreciation in a brief speech which was right up to Demosthenes quality.

The career of Louis Martin emphasizes three requisitions for success in engineering—ability to dream, to do and to describe.

MASS PRODUCTION IS 150: In his editorial in the June, 1948, issue of *The Tool Engineer,* I. F. Holland, president of the American Society of Tool Engineers, calls attention to the fact that it was exactly a century and a half ago that Eli Whitney received from the United States government his initial contract for 10,000 army muskets, to be manufactured under a new system "whereby every part shall be as exactly like every corresponding part, as successive impressions of a copper plate engraving".

That undertaking involved two professions which to all intents and purposes had not existed before in the way that we know them today. One was that of tool engineering. The other was that of machine tool building. Eli Whitney and his small group of associates had to develop both pretty much "from

NEW FORGING TECHNIQUE *Steps up Output, Minimizes Flash*



REDUCED scrap loss, increased die life, and higher production rates are principal advantages of Maxi-rolling, a new forging technique developed by National Machinery Co., Tiffin, O. It is, as the name suggests, a rolling operation done in a press which prepares blanks with accurately reduced sections, that is, stock is distributed to meet needs of final forging.

Auxiliary attachment which does the preforming consists of a pair of reducing rolls mounted in a side window of the press, thus occupying no usable die space. These are driven by the press and roll shaft are designed so that rolls can be changed to

Fig. 1 — Roll and die attachment for forging wrenches is mounted in left-hand window of press

scratch". In view of that, it is not surprising that it took them several years to mass produce their first muskets. The surprising thing is that they ever did produce them.

Certain high government officials of that day—including Thomas Jefferson and Oliver Wolcott—showed patience unusual even in modern business men and understanding far above that of most modern political figures, in bearing with Eli Whitney through the years of costly toolmaking and machine tool building before the first muskets "rolled off the production line". Impatient executives, bankers and sales managers of 1948 might learn a valuable lesson from the history of that original mass production undertaking of 150 years ago—as far as time element and cost are concerned.

Another thing prophetic—we hope—in our own future, is that this Whitney preparedness program did much to keep the United States out of threatened war with Revolutionary France. When that "Directory" government saw that our slogan "Millions for defence, but not one cent for tribute" had real power behind it in the shape of Whitney's mass produced guns, the undeclared war between France and the United States came to an abrupt end.

NO "COB HOUSE" DESIGNS: During the recent semiannual meeting of the American Society of Mechanical Engineers in Milwaukee, Kearney & Trecker Corp.—as one phase of its 50th anniversary—had some extremely interesting personally conducted tours of the plant, and demonstrations of carbide milling operations in machines expressly designed for that purpose.

One thing which interested me particularly is the manner in which power, cutters and work all have been brought into the closest possible relation to each other, thereby eliminating "windup" of shafting and spindles, deflection of bed and frame members, cushioning or "squashing" effect of multiple oil films and similar enemies of rigidity and accuracy.

Years before the advent of high power and carbide tools, the late Gov. James Hartness of Jones & Lamson Machine Co., as president of ASME, used to caution young designers against piling slide on slide in what he called "cob house construction". His theory was that the work should be as close as possible to the bed and that the "push" should be as directly as possible behind the cutting edge—and a right good theory it has turned out to be.

The more I see of machine tools the more I am convinced that the sound common sense of men like the late Edward Kearney, Theodore Trecker, James Hartness and other pioneer machine tool builders who came up through the shop, built a far more substantial foundation under American machine tool design than could have been built by any number of abstract theorists. That solid foundation now gives theoretical men something upon which they can make their theories work—as is the case at Kearney & Trecker.

suit breakdown requirements of dies being used.

Double end wrench job served as a guinea pig for some of the development work. Roll and die arrangement for forging these wrenches is shown in Fig. 1. New reducing mechanism is mounted in left-hand window of the press. Dies used for this development are those regularly used for producing the job on a hammer. Final die design recommended would quite different and much lighter.

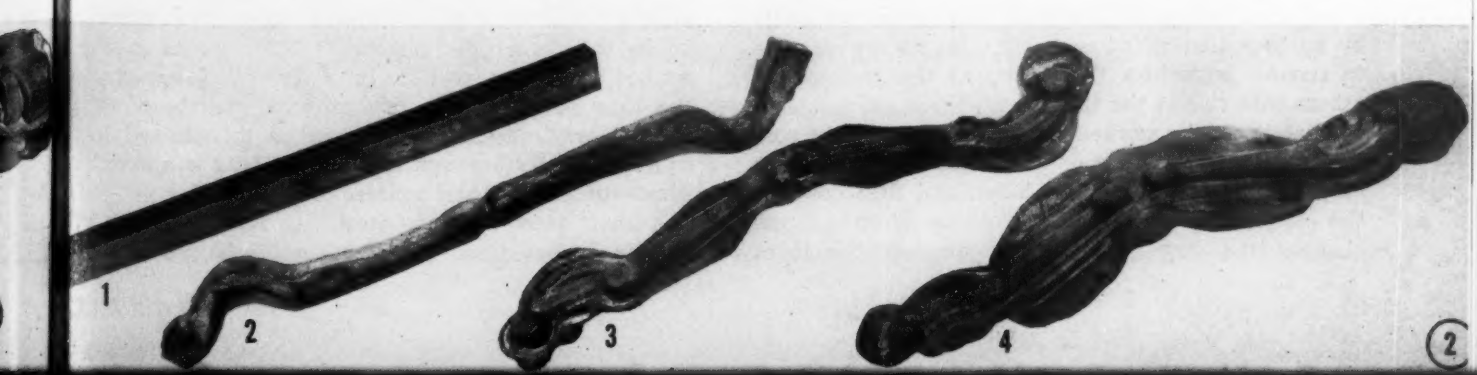
Double length stock (¾-inch diameter and 16-inches long) is shown at the left. In center, forging is shown with one end completed and opposite end rolled preparatory to forging of second wrench. Completed forging on right has a minimum of flash and scale.

Another example of the results obtainable with the process is the camshaft shown in Fig. 2. Preformed blank (2) was reduced in a roll similar to the one shown in Fig. 1. Final forging was done in two impressions, first pass being shown at (3) and final at (4). Sharp detail of the forging and accurate distribution of stock result from Maxiroll method insuring a minimum of flash.

Comparison of a double forging for an automotive steering arm is made with and without the benefit of a preformed blank in Fig. 3. Double forging shown at (3) was made with new rolling attachment and the one at (4) was produced from same set of dies before the new attachment was available. Considerable more flash was produced with the old method. Results of these jobs indicate that the new rolling attachment, in conjunction with properly designed press dies, will show the way to savings of material and increased die life through reduced "washing" of dies on many existing press jobs.

Fig. 2—Final forging on the camshaft was done in two impressions (3 and 4) from preformed blank (2)

Fig. 3—Stock length is sufficient for two steering arm forgings. Forging at (3) made from preformed blank is sharper and better filled than forging at (4) which was made before new attachment was available



FUNDAMENTALS OF Forging

Part two of the series begins a highly practical discussion of how forgings are made, how best to utilize the established laws of metal flow, forgeability of metals, the smith forging method

A FORGING can be defined in several ways. The *Forging Handbook* states that "a forging is metal which has been worked to some definite predetermined shape by a process of hammering, upsetting, or pressing, either hot or cold, or by a combination of several of these processes". Another definition describes a forging as "a structural member of some mechanical device made of metal and produced by mechanical working of the metal after the metal has been heated to its plastic state".

To most people the forging is a piece of metal which has been heated, say to a yellow or nearly white heat, and pounded with a hand or mechanical hammer. Actually, it is the working of metal in its plastic state, just as the housewife works or kneads dough in preparing it for baking. Forging operations, whether a hammer or a press is used, work or knead the plastic metal as easily as the hands knead dough.

To get a good picture of a forging, or of a part that has been made as a forging, it is desirable to understand the difference between wrought and cast metals. Most of the wrought metals were cast metals in the first step of their making. However, not all cast metals can be made into wrought metals.

The process of making steel bars can be used as an example of the steps used to change cast metal into wrought metal. It is generally known that in steel making, the first step is to smelt down iron ore to remove impurities, and that the product of the blast furnace is pig iron. Pig iron is a cast iron, containing iron and some carbon. In open hearth furnaces it is mixed with steel scrap and melted down again to remove some of the carbon, and to add any alloys that are required.

Steel Ingots—When the heat is ready, the molten metal, steel, is poured into large molds called "ingot molds". The steel cools in the molds and becomes solid. Then the molds are stripped off; the large solid piece of steel taken out of the mold is known as an "ingot". In making the steel ingot, it is desirable that as many of the impurities are removed as possible, but in all castings, large or small, a small amount of impurities remain. If such impurities are very small, and if they are evenly and uniformly distributed through the steel ingot casting, they do very little harm. Steel makers try to keep them small and evenly mixed throughout the ingot.

Impurities are usually in the form of oxides, silicates, metalloids, sulphides and similar minute particles. Higher quality steels, such as tool steels, have a smaller amount of impurities because of smaller heats and extra care given. All cast metals have grains which make up the structure of the metal. Fig. 6 shows grain structure in cast steel ingot.

Top and bottom of the steel ingots are cut away by an operation called cropping. Ingots are cropped to remove impurities that settle at the bottom and others that rise to the top. Next, the ingot is heated so that it can be worked down into bars. First step is cogging; from there on the ingot changes into a bloom, from a bloom into a billet, and then down to the desired bar size. The working down process changes the large cross-section area of the ingot down to a much smaller cross-section area and at the same time, lengthens the bar. The lengthening out process of the steel ingot into a very long billet or bar also lengthens out the grains, forming the hair-like structure which is known as fiber structure, or flow lines.

Exact nature of the fiber structure is not too definitely defined, some metallurgists believing that segregation of certain types of impurities in the grain boundaries develops the fiber structure. However, it is known definitely that the fiber structure in wrought metals gives the valuable properties of strength and stamina.

Reason for this strength will be explained more fully in the section on forging design. The further working and kneading of the wrought metals by forging intensifies and compacts the grain structure.

Forging Technique—As stated previously, forging of metals is an art known for thousands of years. Yet it is only in comparatively recent years that man has understood just what happens to the metal being forged. The following discussion will present the interesting and important phases of forging technique but will not consider, for the moment, hammer sizes, heating furnaces or correct forging temperatures. It will be assumed that correct practice is being used for the subject under discussion.

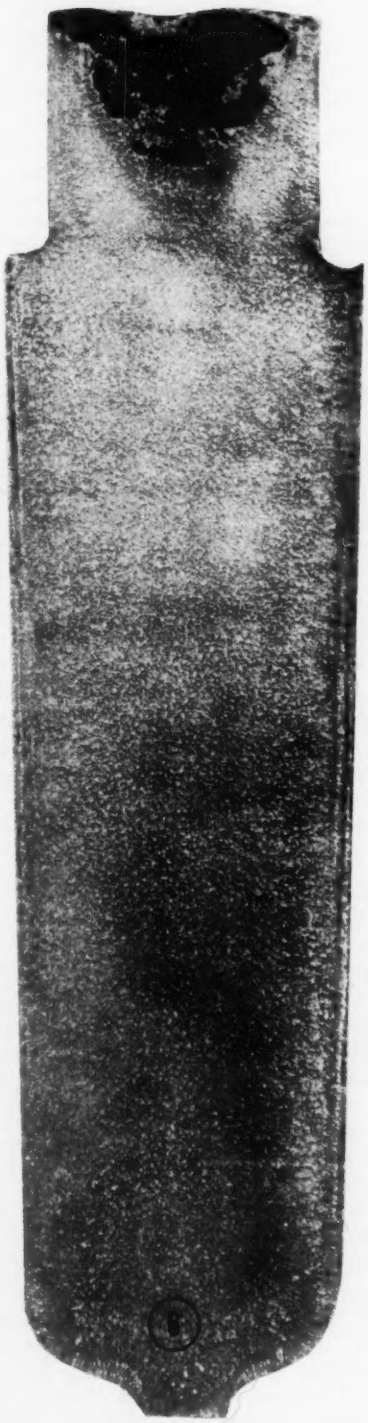
It is known that many metal compositions, such as wrought iron and various kinds of steels, can be shaped by hammering or pressing. Some metal compositions can be melted and cast but they cannot be forged without cracking. Metals having a plastic range at certain temperatures possess that property known as "forgeability". Forgeable metals are those that can be heated to their plastic range and then the shape of the piece of metal can be changed without cracking, breaking, or injuring the metal. In fact, strength and toughness of forgeable metals are improved by the forging process.

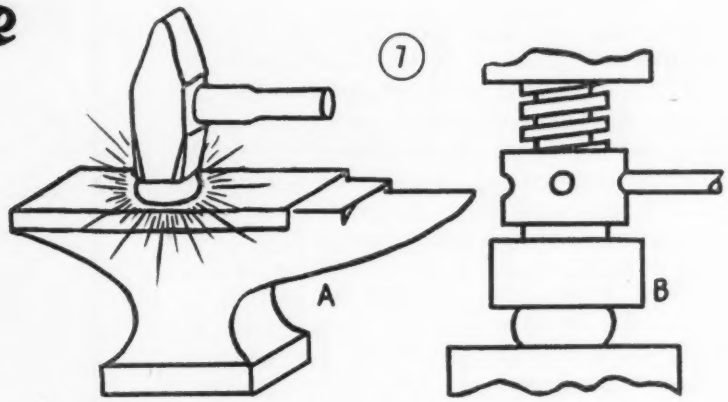
Sufficient pressure must be exerted upon the hot plastic metal to change its shape. This pressure may be in the form of "impact pressure" which is described as a blow, such as the blow of a hammer, or the blow of a fist. Or this pressure may be of the "push" or "squeeze" type, such as is obtained by squeezing putty between the hands. Fig. 7 is a sketch illustrating impact and squeeze pressure.

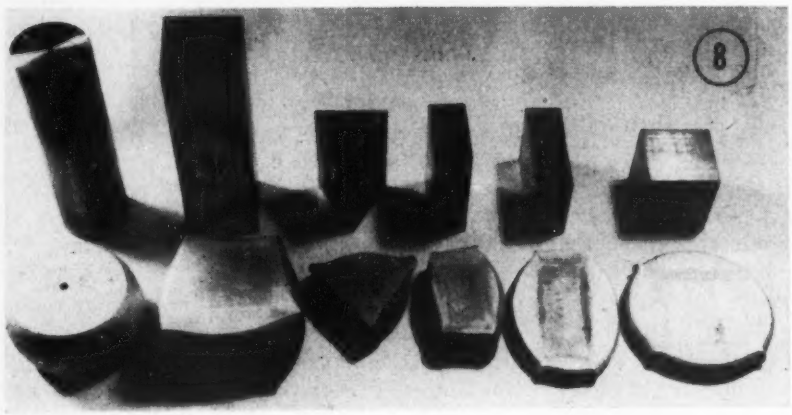
A short piece of round steel, say a piece that is 1 inch in diameter and 2 inches long, is heated to the

By WALDEMAR NAUJOKS

...practice







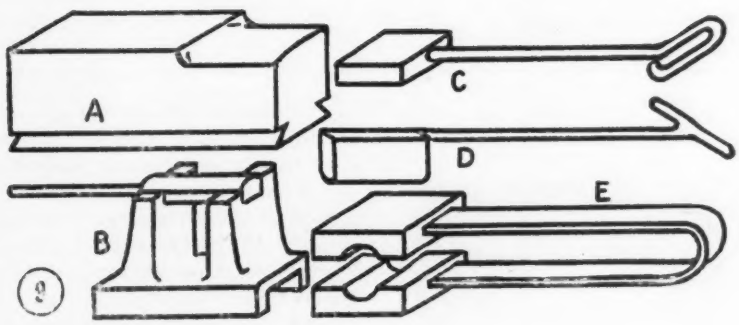


Fig. 6—Grain structure in a steel ingot
Fig. 7—(A) Impact pressure; (B) squeeze pressure
Fig. 8—Pieces flattened by upsetting
Fig. 9—Smith dies and tooling. (A) Bottom flat and fuller die; top die is duplicate to match; (B) Portable saddling die with mandrel; die is placed on bottom flat die of smith hammer and ring to be forged is placed over mandrel; fixed type of saddling dies are fastened in place. (C) Peg or cold stop placed on bottom die to hold proper width or thickness. (D) Notching bar provides notches for reduced section area at desired place. (E) Swage dies for making smooth round diameters

proper temperature to reach its plastic state. It is then possible to place the hot plastic metal on an anvil and pound the small cylinder into a flat disk without cracking or breaking the steel. The fact that heated metal can be pounded down to spread into a flat disk has been known for centuries, and it is known to most mechanical minded people today, even if they have not had any experience with actual forging work.

It is also known today that when the metal is worked from one shape to another by forging pressure, the metal movement, or the flow of the metal, follows definite and known laws of plastic metal flow. Laws of metal flow or metal movement are quite simple. Making use of the simple laws of metal flow to produce various shapes of metal forgings in the various types of metal compositions is not always quite so simple. In other words, the application of the laws of metal flow to the making of forgings is fairly simple in some cases and very difficult in other cases. The primary or basic law that governs the flow of metal when heated to its plastic is that *plastic metal will flow in the direction of least resistance.* The rule for flow of metal is quite simple. Next step is to illustrate the use of the law in forging different shapes.

First, it was stated that if a simple cylinder is upset, allowing the metal to flow in any direction it desires, the metal will spread out evenly in all directions to form a disk, in which the diameter has been increased and the height reduced. If the hot cylinder did not lose any heat except through natural cooling action, and if there were no friction between the dies of the hammer and the faces of the cylinder, then the flattened disk would have straight sides just as the cylinder did before it was forged.

However, the bottom of the cylinder rests on a steel die that is quite cool compared to the yellow-white hot steel cylinder, and the flat face of the bottom of the cylinder cools off faster than the center of the cylinder. Also, the top of the cylinder cools off faster than the center of the cylinder. The top of the cylinder has contact with the striking die with each blow that is struck, so that the top face of the cylinder cools off faster than the center but not quite so fast as the bottom of the cylinder where die contact is continuous.

Also, there is natural friction between the die faces and the faces of the cylinder. The result is that the disk which has been hammered from the cylinder has rounded sides instead of straight sides. Spreading the metal out evenly in all directions is the path of

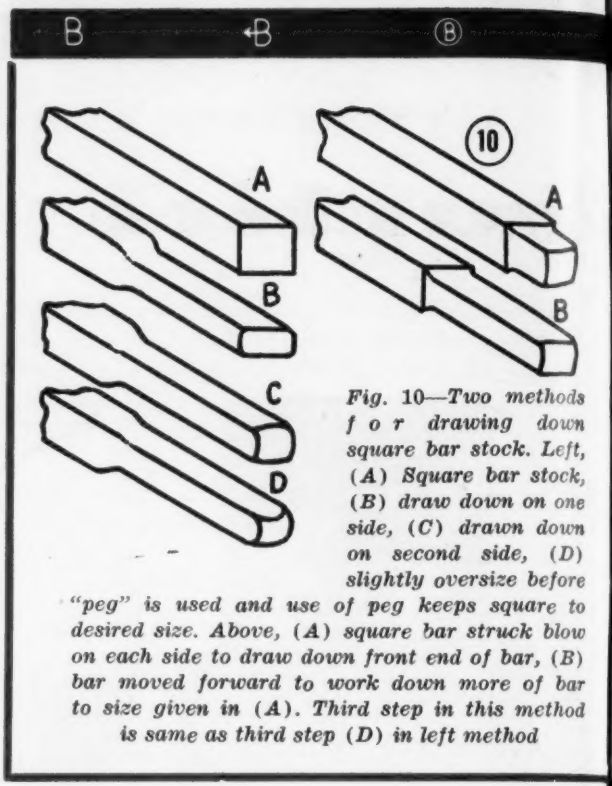


Fig. 10—Two methods for drawing down square bar stock. Left, (A) Square bar stock, (B) draw down on one side, (C) drawn down on second side, (D) slightly oversize before "peg" is used and use of peg keeps square to desired size. Above, (A) square bar struck blow on each side to draw down front end of bar, (B) bar moved forward to work down more of bar to size given in (A). Third step in this method is same as third step (D) in left method

Waldemar (Wally) Naujoks was born in Milwaukee, and acquired the rudiments of forging and machining practice at an early age in his father's tool forging shop. Completing apprenticeship as toolsmith and machinist, he entered the U. S. Navy in 1917. In 1919 he was employed at the Milwaukee Works of the Illinois Steel Co. but left in 1920 to enter the University of Wisconsin. After three years he withdrew to become machine shop instructor at Morton High School, Cicero, Ill. Re-entering Wisconsin in 1925, he graduated with a B. S. degree in mechanical engineering in 1926. Subsequently he acquired a M. S. degree in metallurgical engineering and the degree of mechanical engineer.

A year was spent in the employ of Ladish Drop Forge Co., Cudahy, Wisconsin and in 1928 he joined The Steel Improvement & Forge Co., Cleveland, O., as mechanical engineer and was promoted to chief engineer in 1935. He resigned his position at the end of 1946 to consider business partnership in Buffalo, N. Y. In July, 1947 he joined the Ohio Injector Co., Wadsworth, O., as manager of the new forged valve division.

He is considered an outstanding authority on forging practice and has been active in writing and lecturing. His "Forging Handbook" has been accepted as an outstanding contribution in the metalworking industry. He is past chairman of Cleveland chapter, ASTM, and presently active in the newly formed Akron Chapter. He is also a member of the American Society of Mechanical Engineers, Cleveland Engineering Society, and Army Ordnance Association.

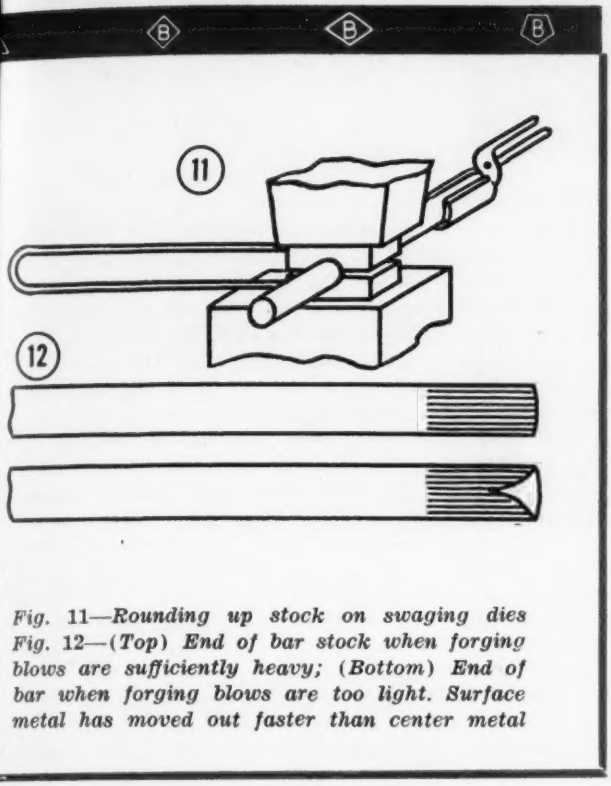


Fig. 11—Rounding up stock on swaging dies
Fig. 12—(Top) End of bar stock when forging blows are sufficiently heavy; (Bottom) End of bar when forging blows are too light. Surface metal has moved out faster than center metal

least resistance for the flow, or for the movement of the metal.

Second example is that of a square slug, similar in proportion to the cylinder, which is flattened down in the same manner that the cylinder was flattened. The metal spreads out in the same manner as it did for the cylinder, but since the corners of the square offer greater resistance to metal movement than do the straight sides, the metal between the corners moves out faster than does the metal at the corners. The result is a shape that is intermediate between a round and a square. It will be noticed that the square slug seems to be trying to change itself into a round disk. Since the top and bottom faces of the square disk are affected by die friction and by the cooling action mentioned for the cylinder, the sides of the flattened slug are rounded similar to the sides obtained in the flattened disk.

A third example is to flatten a rectangular bar, where there are two long sides and two short ones. In the spreading out movement, the metal away from the corners moves out faster than does the metal at the corners, resulting in a final shape that is sort of a long oval. Due to die friction and die cooling action, the sides around the flattened pieces are rounded as in the previous examples. It should be noticed that in all three examples movement of the metal must be outward because the centers are solid metal and it could not move inward.

Fourth example is to flatten a ring, or hollow cylinder, which will permit the metal to flow inward if there is less resistance to metal flow inward than outward. The metal now has the chance to select its path of movement, inward or outward. After the ring has been flattened, it is found that very little has flowed inward; nearly all has moved outward.

It is evident that the metal will spread out in all directions, just as pancake batter spreads out when it is poured on the griddle. If it is desirable to spread out the metal in some directions and not in other directions, it is necessary to place suitable obstructions in its path. Forging dies are designed to allow the metal to flow naturally in the desired directions and to restrict the movement in directions where it should not flow. The next step is to learn how the metal flow is guided in the directions desired. Fig. 8 shows actual pieces that have been flattened.

Smith Forgings—Up to within about 100 years ago, all of the forgings were made by the blacksmith method, where flat dies were used for most of the work, and a few hand tools helped to get crude shapes on some of the parts. The smith method of forging allows the metal to spread out between the flat dies but use is also made of dies that are curved from front to back, or from side to side, so as to get the metal to flow more in one direction than in another, for the work requiring it.

Standard tools of the average smith forging shop include several types of fullering dies which cause the metal to lengthen out faster than it spreads sideways; spreading dies which make the metal spread out faster than it lengthens; saddle dies on which weldless forged rings are made; and some standard swaging dies which are used to round up stock after it has the right diameter. Fig. 9 depicts some of the tools and dies mentioned. Some of the standard operations used in smith work will show how metal is shaped by this method.

First standard operation in smith forging work is that of drawing down billet or bar stock from one size down to a smaller size. For example, it is desired to forge down a 6-inch square bar to a 3-inch square bar. The usual method is to place the heated bar on the fullering part of the forging hammer dies, so that the end of the bar is between the dies. A blow is struck by the hammer which flattens and stretches the length between the dies. The bar is given a quarter turn (90 degrees) and a second blow is struck. The end of the bar is now a smaller square but not quite flat.

Bar is moved forward sufficiently so that the next section of metal is struck in the same manner. Again the bar is moved forward and the two blows are struck with the quarter turn between blows. This is continued until the heated length has been reduced from the 6-inch square to a smaller square but it is not down to the final desired size yet.

Now the bar is moved backward in the same manner, with the hammersmith turning the piece from one side to the other side in quarter turns between each two successive blows. Blows of the hammer are continuous and finally the bar is almost down to the 3-inch square desired.

Then the bar is moved over to the flat die faces and the bar is moved from back to front without turning the piece, just striking it with a series of blows on one side. It is given a quarter turn and moved from front to back without turning so that the second set of sides are smoothed flat. A cold steel block of the right thickness, with a handle for holding it, is placed on the bottom flat die. The steel block is called a

"peg" or a "cold stop" and prevents the hammer from forging the bar below size.

Fig. 10 sketches the series of steps used to draw down bar stock. Notice that the roughing down is performed between dies that are rounded from front to back, known as "fullering dies". Such dies help to stretch the metal in the long direction and slow up the movement sideways. Fullering dies of different sizes are usually available for a variety of work. Pegs of different thickness are also considered standard smith tools.

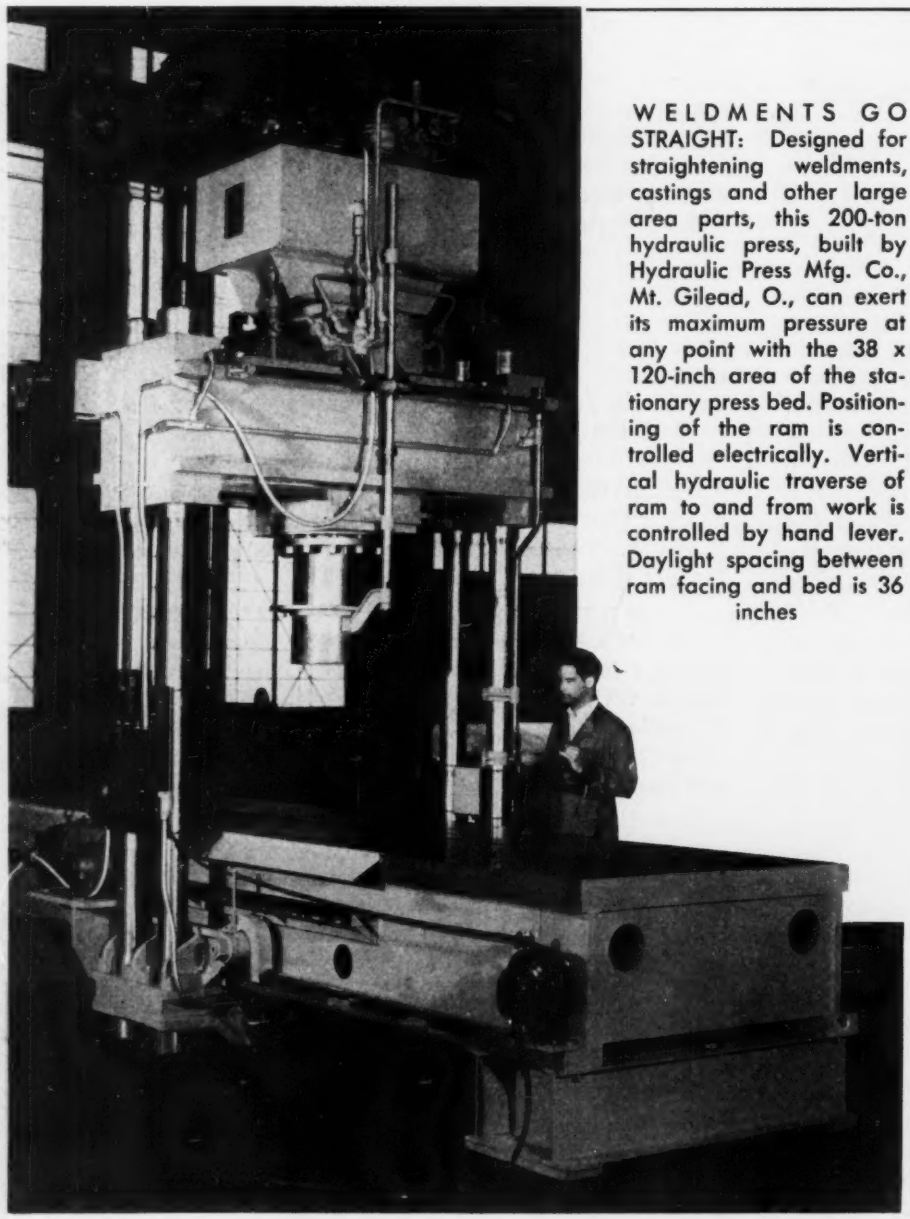
Drawing Down Bar Stock — It is often necessary to draw down square or round bar stock to a smaller round bar. For example, it might be necessary to drawn down a 6-inch square bar to a 3-inch round bar. First part of the operation is to draw down as described above. After the bar is down to the 3 inches square, the four corners are flattened so that the bar is now octagonal. Flattening the corners on a square bar is termed "breaking corners". The eight corners on the octagon shape are again broken down to make the bar a 16-sided figure.

If a true round is desired, the corners may be broken once again to make the bar a 32-sided figure and which is nearly round. Then swaging tools are placed on the dies and light blows are struck as the bar is turned continuously and moved backward and forward. Corners now have disappeared and the bar is round. Bar between swaging dies being rounded up is shown in Fig. 11. It is never proper to try to round up the bar before it is down to size in the square form.

If the smith tries to round up the bar while he is drawing it down, there is the possibility that it will develop a pipe-like crack in the center for the length that is being worked. It is always necessary to draw down to a square and then to break the corners to get the round shape.

It is also important to hit the bar with blows hard enough so that they penetrate throughout the thickness or cross-section area of the bar. When the blows are hard enough, the end of the bar will bulge out in the form of a ball. If the blows are not hard enough, only the top layer of metal will be stretched and the center metal will not move much, resulting in a deep hole at the end of the bar. Fig. 12 shows ends of bars that have been forged correctly and bars that have been forged with blows too light. Notice the piped effect at the end of the incorrectly forged bar.

(To be continued)



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Electrodes for welding hardenable and nonhardenable low-alloy, high-tensile steels as well as cold-rolled and other difficult to weld steels without the necessity of a preheat to avoid underbed cracking were patented recently by McKay Co., Pittsburgh. Sound welds are achieved without preheating by having the electrodes operate in an atmosphere that is very low in hydrogen.

Operation for the all-position electrodes is on direct current reverse polarity with amperage settings slightly below those required for ordinary mild-steel electrodes. Designations of the electrodes as Pluralloy 70, 90, 100 and 110 indicate their respective minimum tensile strengths in thousands of pounds per square inch.

Electrodes have been used successfully for welding high carbon and high sulphur steels and "tailored" versions are possible by adding various alloys to weld metal. Chromium, silicon, molybdenum and nickel are some of the alloying elements that have been added to gain specific weld metal properties.

—o—

Stress-rupture characteristics of various steels in steam at 1200°F are described in a pamphlet published by engineering experiment station at Purdue University, Lafayette, Ind. A discussion of literature dealing with previous tests, a description of apparatus used and a chemical analysis and heat treatment for the steels tested are included.

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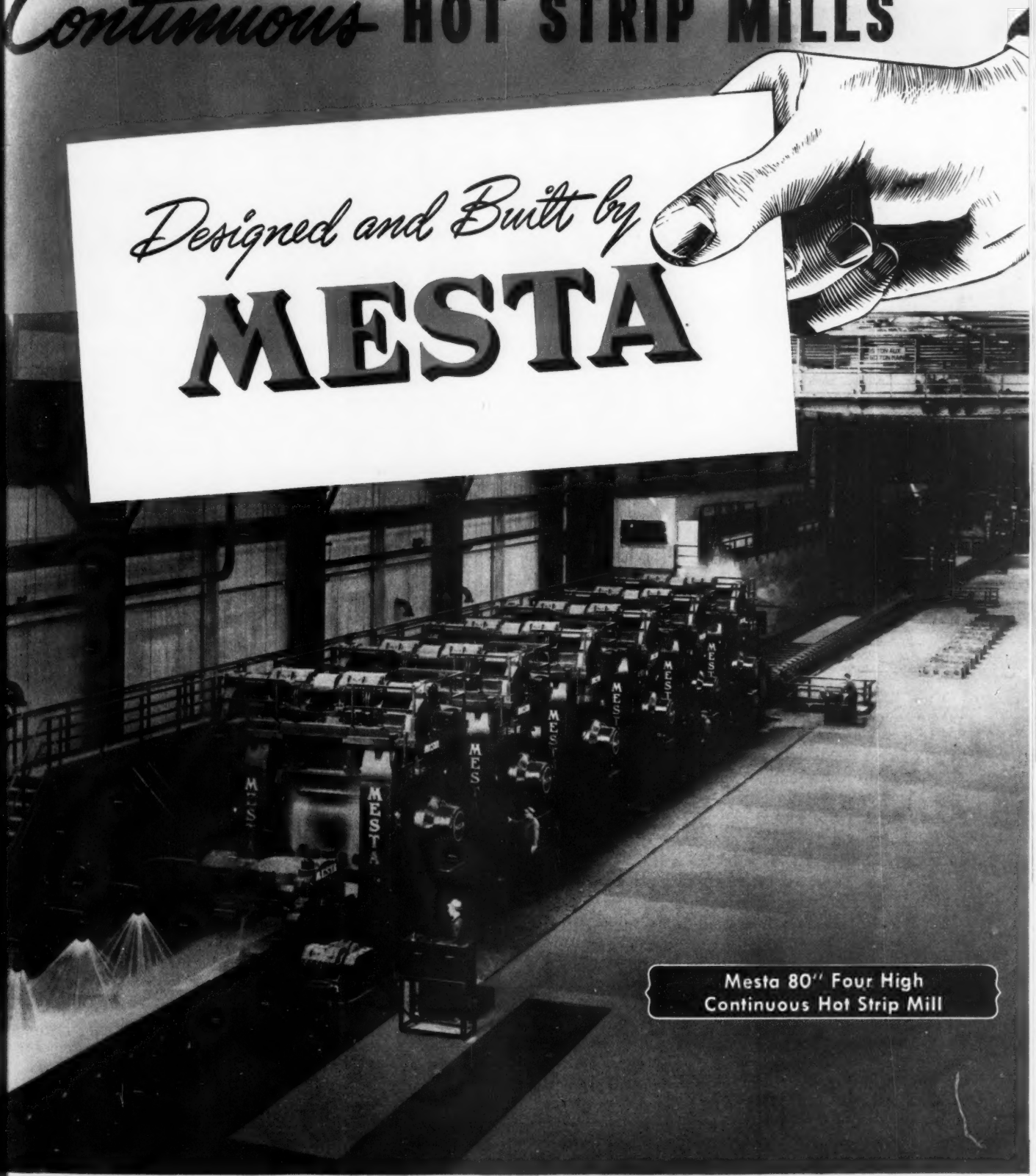

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Atlantic City Scene of

AMERICAN ELECTROPLATERS' SOCIETY

35th Annual Convention June 28 to July 1

LATEST developments in the highly specialized sciences of electroplating and metal finishing and their related fields will receive the attention of those attending the 35th annual convention of the American Electroplaters' Society in Atlantic City, June 28 to July 1. Five technical educational sessions will be held during the four day meeting. Sixteen papers on a variety of pertinent subjects will be presented at the first four sessions. Reports on four society projects will fill out the fifth session.

Technical sessions will be held in the main ballroom on the second floor of the Atlantic City Convention Hall. The main floor of the hall will be the scene of the Industrial Finishing Exposition, to run concurrently with the society's convention. The products of approximately 100 manufacturers and suppliers will be on display.

Headquarters and place of registration for the convention will be the Ambassador Hotel. Registrants at the convention and exposition need not be members of the American Electroplaters' Society.

Abstracts of the 16 technical papers to be presented at the first four educational sessions follow. The schedule of meetings is given on p. 106.

"Industrial Electropolishing" — Charles L. Faust. Factors which influence the decision to use or not to use electropolishing will be discussed. Commercial experience with electropolishing of steel, stainless steel, brass, aluminum, and possibly silver will be cited. Actual cost data will be presented on direct charges for chemicals, labor, electricity, racks, etc., which can be extrapolated to the electropolishing of nickel and copper in the form of either plate or solid metal. The relationship of electropolishing to mechanical finishing prior to electroplating will be of interest, both from the standpoint of cost and technical advantages.

"Electropolishing Silver in Cyanide Solutions"—Daniel Gray. Primary object of this paper is to give a complete description of a practical method of electropolishing silver in cyanide solutions, including make-up of baths, operating conditions, and effects of chemical and electrical factors. In addition, this paper will present in simple, non-mathematical language a theory of the mechanism of electropolishing and a definition of what constitutes an ideal metal to be polished. Stress will be placed on the economic implications of the process and on the wide open field for further research.

"Diaphragm Tanks to Eliminate Roughness in Copper Plating"—R. H. McCahan and C. E. MacKinnon. A new method for eliminating roughness of cyanide copper electrodeposits will be described. This comprises the use of a relatively impervious canvas diaphragm separating anode and cathode compartments, continuous high-efficiency filtration from anode section to cathode section, and elimination of exposed metal surfaces in contact with the cathode electrolyte. By this method, combined with adequate solution circulation or work movement, smooth heavy plates may be obtained rapidly. Full operating details will be given.

"Oxidation of Trivalent Chromium in Chromic Acid Plating Baths" — Robert Seegmiller and Vernon Lamb. In those chromium plating opera-

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tions in which the anode area is necessarily restricted, the concentration of trivalent chromium tends to increase to objectionable values. A study will be presented of the effects of such factors as the concentrations of hexavalent and trivalent chromium and sulphate, temperature and current density, upon the rates of reoxidation of trivalent chromium. From these results, favorable conditions for this reoxidation can be defined.

"Description, Design and Production Costs of Conveyorized Spray Finishing System"—E. Paul Schwartz. Conveyorized spray finishing system to be discussed consists of spray-bonderizing for steel, aluminum and zinc parts, followed by a gas fired dry-off oven, water wash booths, and a gas fired baking oven. Details, such as temperatures, speeds, and solutions, will be included in the paper, and drawings, photographs, and a model of the system will be shown. The steps covered in the design of the system are (1) preliminary studies, (2) layout, (3) specification of equipment. Under preliminary studies, the importance of production planning, tabulation of existing data, and a thorough study of methods of racking and handling will be stressed. The layout methods are to be described, and some of the problems involved will be discussed. Under specification of equipment, details of construction and ideas incorporated in the design are to be described, also troubles which may develop. Changes which were required after installation will be pointed out. These should be of interest to the designer of new equipment. Complete data will be made available regarding cost of chemicals and labor used for cleaning and bonderizing. Data will be presented in chart form comparing labor costs of handling and spraying using trucks with conveyorized handling.

"Electroplaters Metals of the Future"—F. A. Lowenheim. This paper is essentially a review of the work which has been reported on the electrodeposition of the "uncommon" metals. A rather thorough literature search has been made, and the salient features will be pointed out. More or less detail will be offered depending on the present state of the art. Thus the deposition of manganese, antimony and tungsten is to be considered in some detail, while such metals as tantalum and titanium, etc. will be mentioned only briefly. The ground covered will be similar to to that in Dubpernell's "Periodic Chart for Platers" (Proc. Am. Electroplaters' Soc., 1946) but the approach will be different, with more attention to actual details of the plating of the metals and less to an attempt to systematize the available information.

"Importance of Acid Ratio in the Phosphatization of Steel"—Nelson F. Murphy and Michael A. Streicher. A study will be presented of the effect of acid ratio, i.e. ratio of total to free acid contents, on the phosphatization of steel. It will be shown that the acid ratio may be accurately determined by using brom-phenol blue indicator in the free acid titration and phenolphthalein indicator in the total acid titration, and that the pH of the phosphatization solution is a function of the acid ratio for in concentration ranges studied. Affected by the acid ratio are (1) the amount of

(*Please turn to Page* 122)

EDUCATIONAL SESSIONS

All Meetings in Main Ballroom, 2nd Floor, Convention Hall

Monday, June 28

2:00 to 4:30 P.M., First Session, William Geissman, S. K. Williams Co., Milwaukee, presiding

"*Industrial Electroplating*", Charles L. Faust, Battelle Memorial Institute

"*Electropolishing Silver in Cyanide Solutions*", Daniel Gray, Oneida Ltd.

"*Diaphragm Tanks To Eliminate Roughness in Copper Plating*", R. H. McCahan and C. E. MacKinnon, E. I. Du Pont de Nemours & Co.

"*Oxidation of Trivalent Chromium in Chromic Acid Plating Baths*", Robert Seegmiller and Vernon Lamb, National Bureau of Standards

Tuesday, June 29

9:30 A.M. to 12:00 Noon, Second Session, Leonard Weeg, C. G. Conn Ltd., Elkhart, Ind., presiding

"*Description, Design and Production Costs of Conveyorized Spray Finishing System*", E. Paul Schwartz, L. C. Smith-Corona Typewriter Corp.

"*Electroplaters Metals of the Future*", F. A. Lowenheim, Metal & Thermit Corp.

"*Importance of Acid Ratio in the Phosphatization of Steels*", Nelson F. Murphy and Michael A. Streicher, Department of Chemical Engineering, Virginia Polytechnic Institute

"*Metal Cleaning*", George B. Hogaboom, consultant

Wednesday, June 30

9:30 A.M. to 12:00 Noon, Third Session, George P. Swift, consultant, Boston, presiding

"*A Circulating Electrolyte Cell for Strip Plating Evaluation*", R. A. Dimon, Carnegie-Illinois Steel Corp.

"*Bright Barrel Plating of Nickel and Zinc*", Leonard A. Chesworth, United-Carr Fastener Corp.

"*Plating Copper-Zinc Alloys*", A. Kenneth Graham, Graham, Crowley & Associates Inc.

"*Deposition of Metals on Plastics Employing Reduced Copper Films*", Harold Narcus, Electrochemical Industries Inc.

Wednesday, June 30

2:00 to 4:30 P.M., Fourth Session, Howard Woodward, Sundmark Supply Co., Los Angeles, presiding

"*Judging the Quality of Plated Parts*", William M. Phillips and F. L. Clifton, General Motors Corp.

"*Practical Methods of Cost Finding and Estimating on Metal Finishing*", Adolph Bregman, consultant

"*The Spiral Contractometer, A New Instrument for Measurement of Stress in Electrodeposits*", Abner Brenner and Seymour Senderoff, National Bureau of Standards

"*Engineering Planning in the Plating Room*", S. M. Martin, United Chromium Inc.

Thursday, July 1

9:30 A.M. to 12:00 Noon, Fifth Session, Louis Weisberg, Chairman, Research Directing Committee, presiding

Project 5—"*Some Effects of Copper As An Impurity in Nickel Plating Solutions and Its Effect on the Salt Spray Resistance of Nickel and Chromium Deposits on Steel*", D. T. Ewing and Robert Rominski

Project 6—"*Determination of the Porosity and Corrodibility of Electrolytic Metal Foils*", N. Thon and D. K. Kelemen

Project 7—"*Effect of Internal Stress on Thickness Determination by the Jet Method*", Harold J. Read

Project 9—"*Physical Properties of Nickel Deposits*", Abner Brenner and Charles W. Jennings

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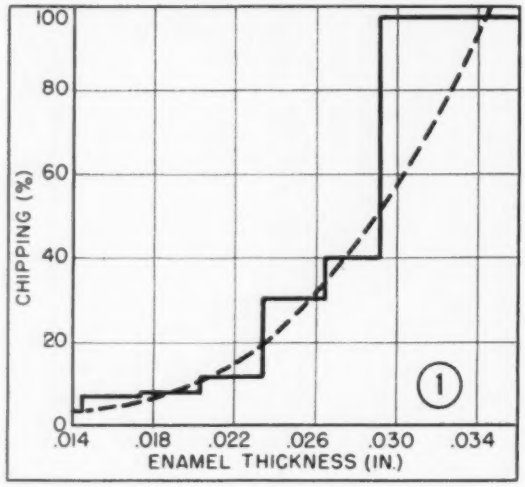


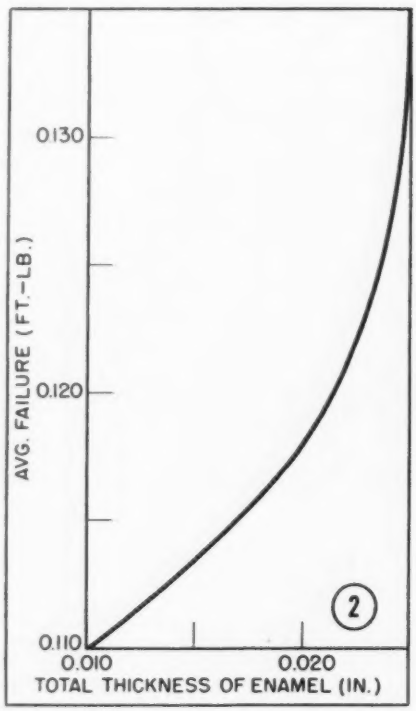
Improved Physical Properties of

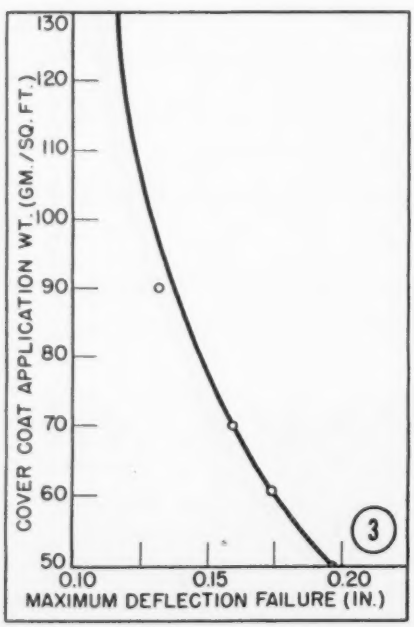
Titanium Enamels

Provide Better Steel Finish

Scratch, abrasion and impact resistance, reflectance, opacity or hiding power, resistance to chemical attack enhanced by continued development work in the use of titanium dioxide

By BURNHAM W. KING
Harshaw Chemical Co.
Cleveland





ONE of the most important advances in recent years in the field of porcelain enameling has been the development of what are known as "titanium enamels." Titanium dioxide has for some time been successfully used as a pigment in the paint industry. Properties of high index of refraction and lack of objectionable color made the use of titania appear desirable.

However, when oxide was added to the ordinary enamel formulations, it dissolved and its value as a pigment was lost. Therefore, before this material could be used successfully, a special enamel composition had to be developed.

Probably the first published compositions that showed promise were those made public 6 or 7 years ago by S. G. Tinsley, an Englishman. Research in this country was intensified and shortly after the war several titanium enamels appeared on the market. First compositions were a creamy white and showed some disadvantages when used in production in the enameling plants. By continued development work these objectionable features have been now largely overcome, and titanium enamels have gained general acceptance in the industry.

Solution of the problem of how to use titanium dioxide to produce opaque white porcelain enamels may now be outlined briefly as follows. Porcelain enamel is a glass fused on metal. In the first stages of making such an enamel, the various ingredients such as silica, borax, and other oxide and fluoride compounds are fused together to form a glass. In the case of titanum enamels, a considerable amount of commercially pure titanium dioxide is added to the raw batch. When the materials are melted, the titania must dissolve completely forming a clear glass which is then quenched in water. This quenched glass which is called frit is ground with water, clay, electrolytes, and usually a small amount of opacifying agent until most of the material is less than 0.003-inch in diameter. The milled material has the consistency of thick cream and is suitable for applying by dipping or spraying.

After the wet enamel is applied to the ware it is dried and fired at around 1500°F. During this firing the little particles of enamel glass fuse together forming the smooth glossy surface typical of porcelain enamel. At the same time, the titanium dioxide which was previously dissolved by the other glass-forming constituents now crystallizes in minute particles. Because these crystals have a much higher index of refraction than the glass in which they are dispersed, they scatter the light reaching them and in this way produce a very opaque white enamel.

Thus the whole problem of making white enamels with titanium dioxide was one of solution and crystallization, solution of the titania during smelting and recrystallization during firing. Of course the enamels have to be very carefully formulated to produce satisfactory opacity and col-

Fig. 1—Per cent of failure due to chipping vs. enamel thickness. Data from Holscher

Fig. 2—Impact to produce failure vs. enamel thickness. From Fellows

Fig. 3—Cover coat application weight vs. deflection to produce failure. From Fellows

or over the range of firing conditions met in commercial practice. Other qualifications must be met as well, such as gloss, abrasion resistance and chemical durability.

Color—Leaving the matter of opacity or hiding power for the time being, the other properties of titanium enamels will be considered. First there is the matter of color. Enamels can be prepared which although generally classed as white may vary anywhere from a blue or blue-green white to a cream white. Sometimes a white which is lower in green is desired and this can be produced by adding suitable color oxides when the enamel is ground.

There is no generally accepted standard gloss requirement in the enamel industry, but titanium enamels as a class show high gloss. Although there is some difference in the gloss obtained with frits from different suppliers, the enamels in general are as good or better than the enamels which have been in use for a number of years.

Titanium enamels in general have very good scratch or abrasion resistance. This is very well demonstrated by tests by Prof. Petersen[3] of the University of Illinois. A group of seven typical enamels representing four different types, were tested by a rolling ball gage test and with a Taber abraser. Two titanium enamels were included in the group. These two enamels rated either first, second, or third in every test but one, and in that test all of the enamels showed very slight abrasion.

One valuable characteristic of porcelain enamels is their resistance to chemical attack. Table I summarizes some data on acid and alkali resistance enamel.

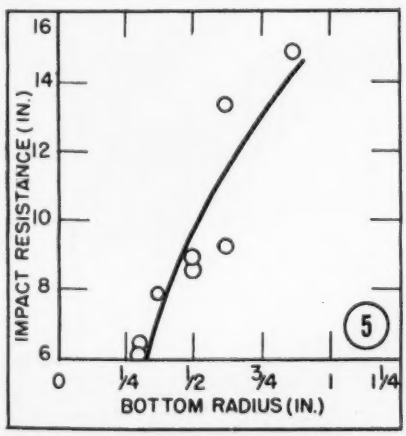


Fig. 5—Impact resistance of enamel pans to blow struck on bottom radius vs. magnitude of bottom radius (for 28-gage metal). From Petersen and Andrews

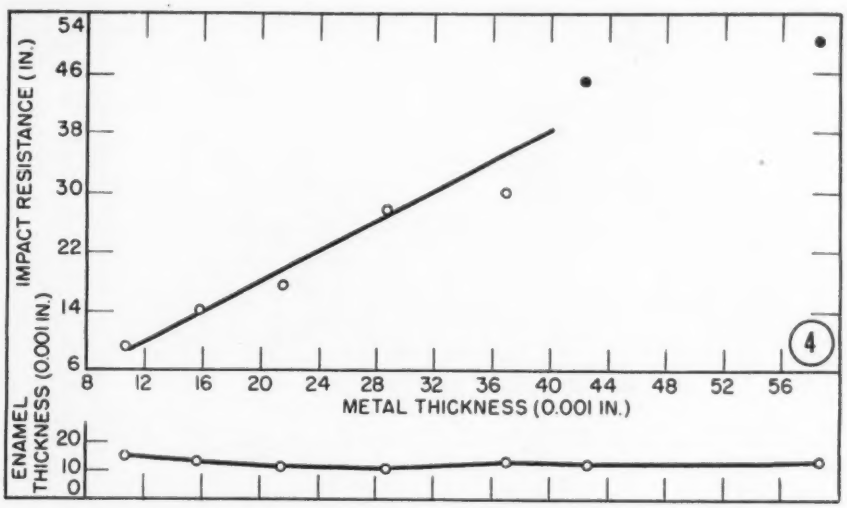


Fig. 4—Impact resistance vs. metal thickness. From Petersen and Andrews

Whiteness—Having discussed briefly some of the chemical and physical properties of titanium enamels, the subject of reflectance or whiteness will be dealt with in more detail. High reflectance is probably the most important single property of titanium enamels, for it is because of this property that much thinner coatings of enamel are possible. In general, it has been found that a reflectance of at least 75-80 per cent is necessary to give a satisfactory white. This has meant that a gradual decrease in weight and thickness of application is made possible as the reflectance of enamels is improved.

Decreased Enamel Weight—There has been a very decided decrease in enamel weights and thickness in recent years. Most of the change has been effected by improvements in cover coat enamels but at the same time there has been a gradual decrease in ground coat application weights as well. This has resulted in a drastic lowering of the total enamel thickness. For an acid resistant finish an additional coat was necessary over the first three types which increased the weight of application of the above enamels from 10 to 30 grams per square foot and the thickness from 2 to 6 mils.

With titanium enamels, such an application is not necessary. Up to the present time, it had always been difficult to get good acid resistance along with good coverage or hiding power. If one improved, the other was usually impaired. With titanium enamels, however, it is possible to get acid resistance along with higher reflectance and greater hiding power than was ever before attainable.

Effect on the enamel industry is far-reaching. The immediate result has been that the weight of enamel applied on many types of ware has been greatly reduced. This has been accomplished without any sacrifice in the quality of the product and in many cases the enameled article has been rendered more serviceable.

This raises the whole question of just what is the best thickness for an enamel coating. There has been some confusion on this point within the industry and undoubtedly more outside of it. Twenty years or more ago enamelware was specified on the basis of a minimum weight or thickness of application. Then in 1932, Holscher[5] published some plant records which showed that the failures of enamel shapes during assembly increased as the thickness of the enamel was increased. These data are shown in Fig. 1.

Later tests by others, showed that porcelain enamel has a very decided strengthening effect on sheet steel.[6,7] A number of reports state that the heavier the enamel on a fairly sharp radius, such as the bottom of a cooking pan, the greater the blow required to break the enamel.[8,9] Fig. 2 illustrates what happens when a

(Please turn to Page 128)

TABLE I

WEIGHT LOSS IN GRAMS PER SQ. IN. AFTER VARIOUS TREATMENTS

Enamel	2½ Hr. In Boiling 10% Citric Acid	18 Hr. At 180° F In 7% Na_2O
Titanium Enamel	.0015	0.083
Acid Resistant Enamel	.0008	0.036
Other Commercial Types	.0130–.3400	0.084–0.192

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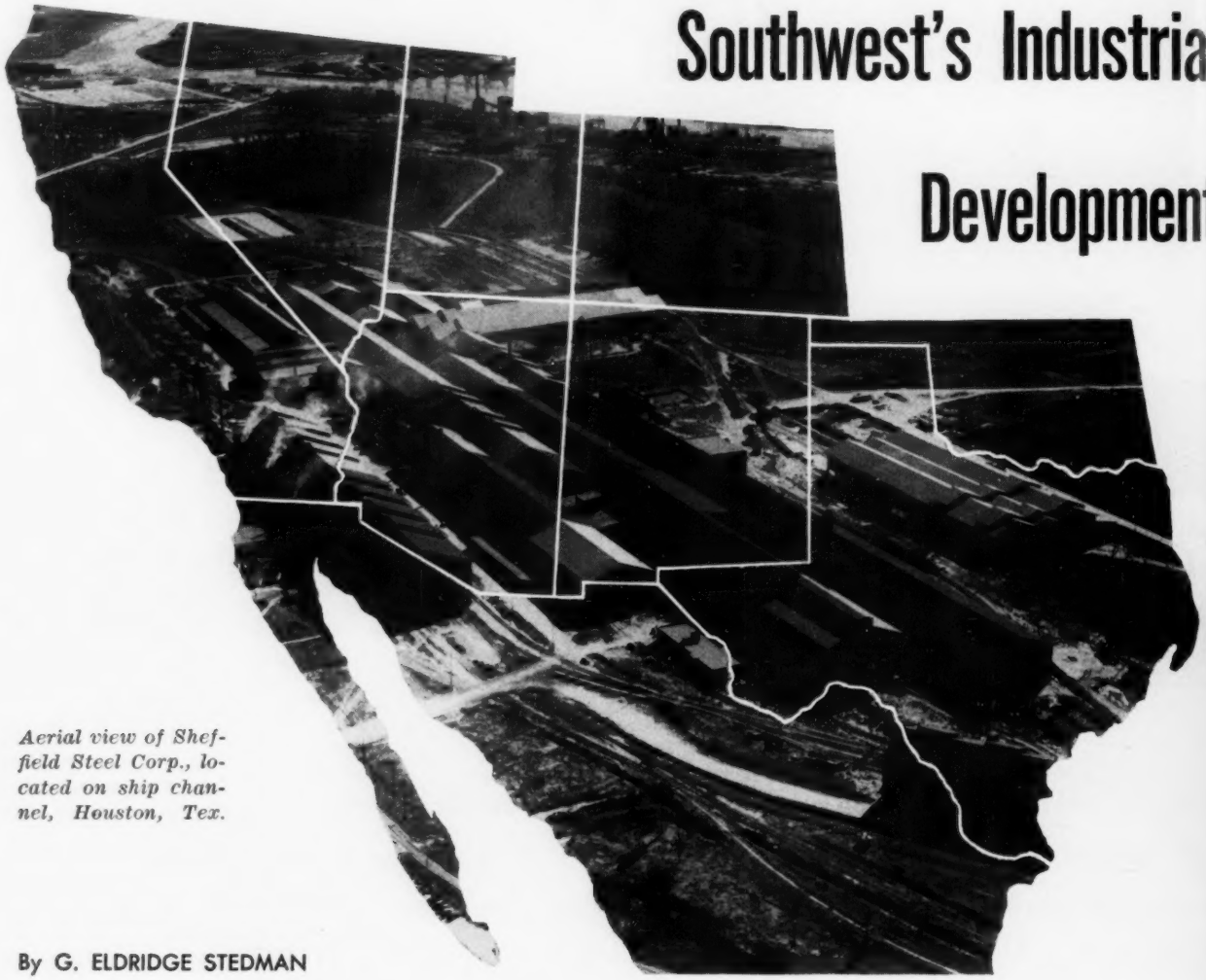


Aerial view of Sheffield Steel Corp., located on ship channel, Houston, Tex.

By G. ELDRIDGE STEDMAN

COMPLETED, underway, or announced, Houston's post war construction program totals over $600,000,000. Better than $200,000,000 of this is industrial and much of it along the Houston Ship Channel, whose 1947 cargo handling of near 35 million tons ranks Houston third among the nation's deep sea ports. New chemical, synthetic rubber, petroleum products, paper and cement plants, steel mills, ship construction, iron and steel fabricators, spotlight Southwest industrial expansion.

Houston's metropolitan employment on Jan. 1, 1948 totaled well over 300,000, considerably higher than war production peak. Sheffield steel mills, whose loading docks on the channel side of its 600-acre site are 15 miles from Houston as the channel winds, 13 miles by road, just upstream from the Todd of Houston and Brown shipyards.

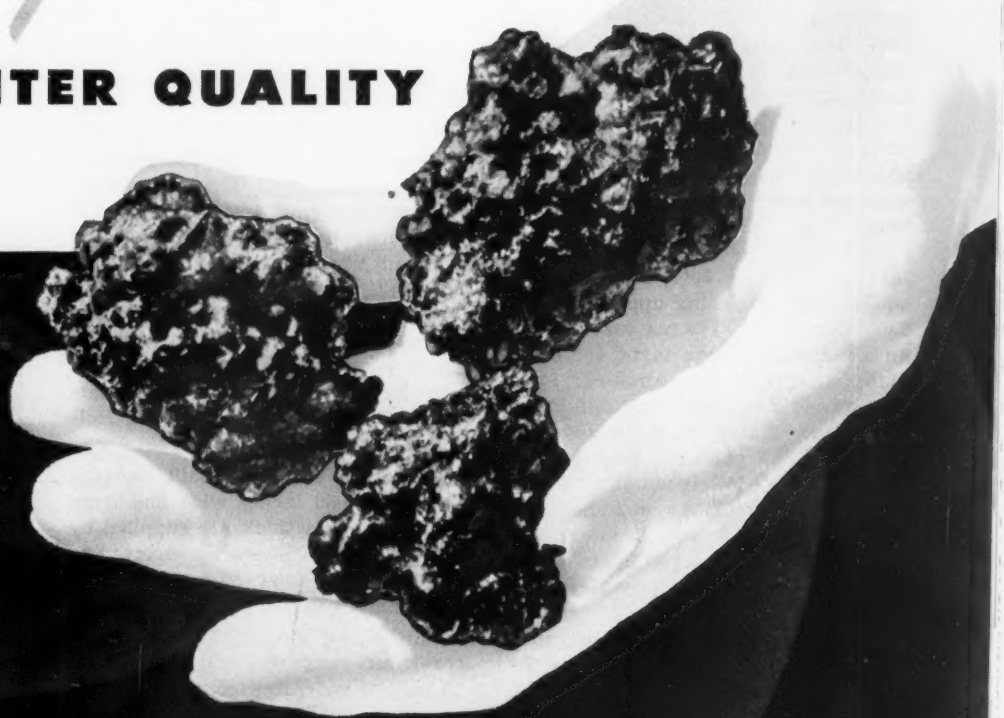
Sheffield Steel at Houston, with its sister Sheffield steel mills at Kansas City, Mo., and Sand Springs, Okla., comprise the Sheffield Steel Corp., subsidiary of Armco Steel Corp. Researched in 1936-1938, starting operations in 1942, augmented by DPC facilities for its war production terminating in 1945, now completely integrated and expanded for peacetime production of structural, plate, merchant bars and wire products, Sheffield Steel of Houston is contributing much to Southwest industrial development, both in construction and in the attraction of new fabricators into the area. Present employment is 3000 people.

A blend of four coals is used in coking practice, namely, New Mexico coal, Oklahoma low volatile, Oklahoma high volatile, and Alabama high volatile. Sheffield buys all its coal, leases its Texas ore mines, buys Mexican iron ore and manganese ore. Ores are not classified or sized, merely being crushed and washed. Coals also are washed.

Coal comes in hopper cars to breaker building, is crushed in hammer mills and moved into four 150-ton mixer bins. Percentages are drawn from each of these bins by mixer belts into pulverized blending and the coal then moves into two 550-ton divided storage bins ready for coke oven charging. These serve 47 Koppers 18.46-ton coke ovens of the under-generative, Becker type. Coke is transferred from the wharf to two furnace bins by belt conveyor, 1400 feet long. Coke breeze from the screening operation is used in mill soaking pits; nut coke is sold; larger sizes are used at the blast furnace.

Ore, coal and limestone are handled in hopper cars to storage yards or bins, the Robbins vibrating shakeout unloaders being in universal use. The storage yard is serviced by gantry crane with 2-yard bucket. A 50-ton transfer car serves the trestle and two 25-ton scale cars the stockhouse. Yards, furnace, open-hearth, mills and pig machine are served by nine diesel locomotives. The 750-ton stack is 94 feet 10 inches high with 22-foot hearth, 25½-foot bosh and 14 tuyeres. Blast is supplied by a 60,000 cubic feet per minute Ingersoll-Rand

NEW McKEE-DESIGNED ROTARY AIR-COOLER *Improves* SINTER QUALITY



McKEE leadership in the field of ore beneficiation is again demonstrated by the McKee-designed rotary air cooler for sintering plants.

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turboblower. Slag is dumped in pits to cool and then dug by diesel shovel to be processed through the Houston Slag Materials Co.

Plant water is pumped from deep wells on the property whereas service water for the furnaces and condenser use is secured from the ship canal. Power for mill operation is purchased; that used at the blast furnace and coke ovens is generated by the company.

Six 100-ton open-hearth furnaces comprise the steelmaking facilities. One furnace is built with basic end-walls and the remaining five will be converted to this type of construction this year. The furnaces are are charged from both ends of the floor and are oil-gas fired. A telautographic system between laboratory and the open-hearth floor permits checks in less than 5 minutes, three analyses being made during the average heat.

Steel is top poured into three popular size molds, a 20 x 20 x 68 inch square ingot weighing approximately 6800 pounds for blooms and billets, an 18 x 28-inch slab ingot for light plates weighing approximately 9200 pounds and an 18 x 41-inch slab ingot for heavier plates weighing approximately 10,800 pounds. High-carbon and alloy steel is left standing in the mold until completely solidified before being moved, but carbon ingots are stripped and charged in the soaking pits as soon as possible after pouring.

Six circulate pits, 20 x 9 feet, with a holding capacity of 32 square ingots, or from 20 to 26 slab ingots, serve the blooming mill. These are gas fired at 2400 degrees Fahr. and are charged by two 7½-ton cranes. Ingots are charged far enough apart to permit heat to circulate around all four sides. Holding time ranges from 2½ to 8 hours, depending on the temperature of the ingot when charged and the chemical analysis of the steel.

Sheffield's rolling facilities include the following type mills:

36″ blooming
19″ 6-stand billet
26″ 5-stand structural
14″ merchant comprising an 18″ 3-high roughing and a 14″ 5-stand finishing
10″ rod and merchant
112″ 3-high plate

All mill equipment was installed new except the 19-inch billet mill which was secured through Frank B. Foster, Pittsburgh, from the plant of the Wheeling Steel Corp., Steubenville, O. The government installed a 110-inch heavy plate mill at the Houston works for war production. This mill, with its drive and tables was leased from the Brier Hill plant of the Youngstown Sheet & Tube Co. At close of war production, it was returned to the lessor and is understood to have since been sold to Holland.

Slabs for the plate mill ranging from 20 to 36 inches wide and from 2 to 4½ inches thick are supplied by the bloomer. These are converted to plates from 9 gage to ½-inch thick and from 40 to 100 inches wide.

Billets and blooms for the structural mill range from 4 x 4 to 10 x 10 inches, weighing from 840 to 5400 pounds. These are sheared to the length and weight best suited for the finished section and transferred by a chain conveyor to the structural mill billet and bloom yard. High-carbon and alloy steel blooms are put into slow cooling pits for 48 hours to eliminate any interior cracks. After cooling, the blooms then are scarfed to eliminate any surface defect. Products from the structural unit are 5 to 10-inch channels and beams, 3 to 7½-inch rounds, 2½ to 6½-inch squares, and 3 to 6-inch angles.

All billets, blooms and slabs are reheated before rolling on structural or plate mills. Billets for the merchant mill, except the 4 x 4's which are finished on the bloomer, are rolled through the 6-stand continuous billet mill which is in line, but some 400 feet from the blooming mill. Billet sizes for the merchant mill range from 2½ x 2½ to 4 x 6 inches, depending on the section rolled. Output of this mill includes 1¼ to 3 x 2½-inch angles, 1½ to 6 flats, 1 to 2½ rounds and squares, plain or reinforcing, and 3 and 4-inch beams and channels.

The combination rod and bar mill rolls rods from No. 5 gage to 1 inch diameter, rounds and squares from ⅜ to 1 inch and small bands and angles.

The rod mill uses just one size billet for all sections, namely, 2 x 2's from 25 to 30 feet long. Rods are converted wire, nails, barb wire, field fence and welded wire mesh for reinforcing concrete pipe and concrete highways. Bars rolled on this mill are shipped to customers to be used for bolts, plain merchant stock, and for concrete reinforcing.

Quenching Steels

(*Concluded from Page 95*)

at 400°F. He found relatively few steels which would harden on a 4-inch cube. They are given in Table II together with the austenitizing temperatures. Miscellaneous data comparing oil quenching with salt quenching are assembled in Table III. Roshong[23] recently pointed out that at the time it was not accurately known how many of the oil hardening tool steels would respond with full hardness on quenching in molten nitrate baths at 375 to 400°F.

Several martempering procedures are prevalent. Shepherd[19] recommended quenching to a temperature between 300 and 400° F, holding a short time and following with an air cool. By definition, however, martempering would consist in quenching to some 20 to 50° F above the M_s or A″ temperature, holding to equalize the temperature of the steel and allowing the austenite-martensite transformation to proceed.

For some large section parts it has been found expedient to quench considerably below the M_s temperature to insure hardening to the center of the part. On occasion, after a short time period at the lower temperature, the piece is equalized at a somewhat higher temperature. Legge[18] has given optimum sizes for several steels which may be austempered, Table IV.

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More than 30 modern machines from a diversified line of excavating, hauling, concrete and materials handling equipment will be exhibited by Koehring Co., Milwaukee, and several subsidiary companies at American Road Builders Association show that will take place in Chicago on July 16-24.

Giant Pressure Vessel

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GIANT chamber for testing underwater equipment at U. S. Naval Ordnance Laboratory, White Oak, Md., was completed recently at the Barberton, O., plant of Babcock & Wilcox Co. The vessel is 40 feet long and weighs 220 tons. Because of the dimensions of ring against which the tank door closes, test chamber was loaded on a depressed car with special handling and routing necessary enroute to its destination.

Inside diameter of chamber, Fig. 2, is 100 inches and main shell is made up of three sections each 105 inches wide. Vessel is upside down so that the front head, Fig. 1, could be dropped in place with an overhead crane for the 2000 pounds per square inch hydrostatic test. Rings and door for test chamber were cast by Adamson United Co., Akron, and allow for opening of chamber to its full diameter so that large test pieces may be introduced.

When vessel is in operation, a hydraulic system operated by an oil pump and controlled by push buttons will lower the door out of the way and raise it again into position. When door is shut, it will be held closed by locking pins. Vessel has four 12-inch diameter inspection ports which allow for thick glass sight openings.

Fig. 1 (top)—Front head of test chamber consists of a locking ring matching ring on shell, and an elliptical head welded to ring which allows for opening of chamber to its full diameter

Fig. 2 (bottom)—Welds joining the three 105-inch wide sections of pressure vessel are being examined by magnaflux. Light streaks and circles represent the magnaflux powder

List Contains Approved National Standards

List of all national standards approved by American Standards Association, New York, was published recently and may be secured from the association. The standards listed have been developed through the procedure of the association by the national groups in each of the fields covered. This procedure has assured acceptance of the standards by a consensus of all groups concerned.

Included in the list are national standards for such important problems as dimensions of machine tools and parts, rating and testing of electrical equipment, dimensions and identification of pipes and piping, building code requirements, industrial safety and health, and abbreviations, symbols and definitions used in technical literature.

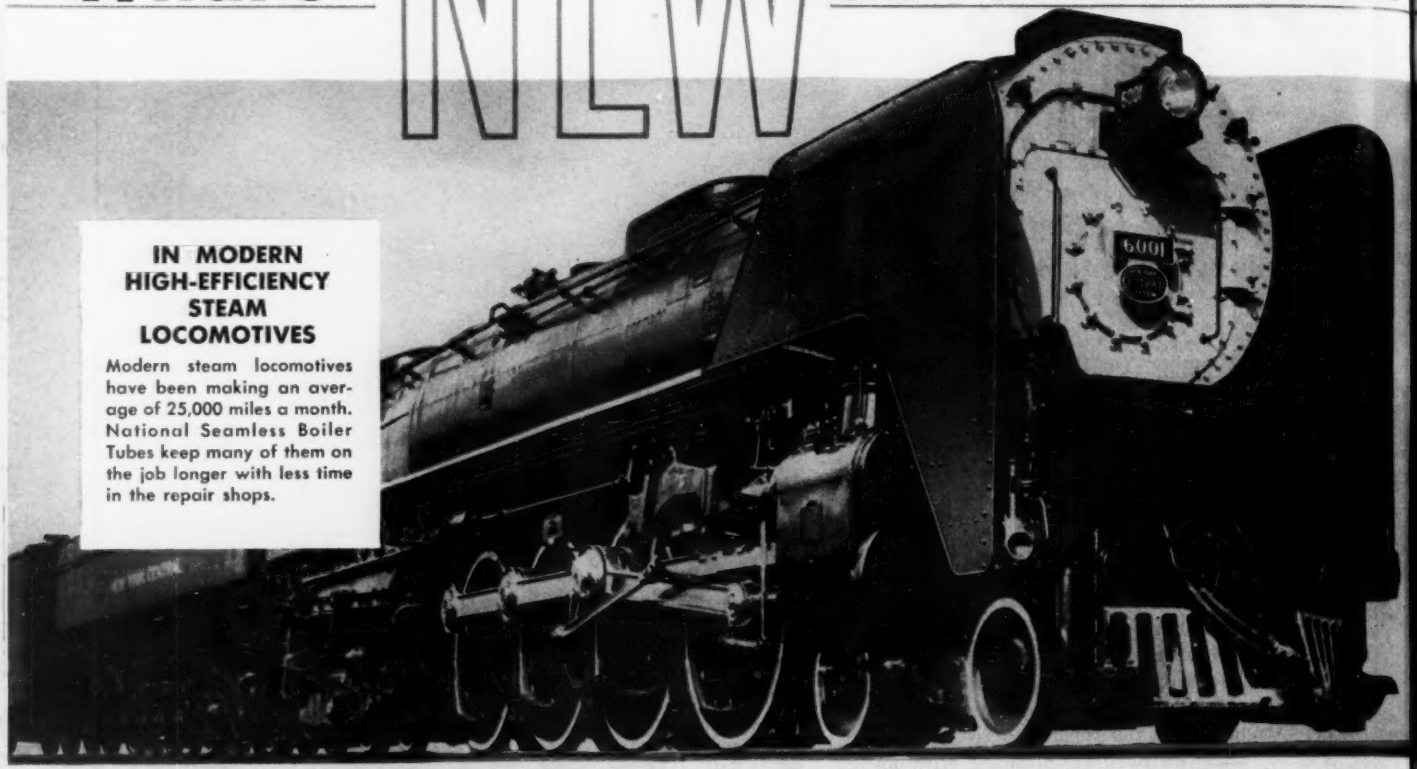
Accessories Developed For Spectrographic Use

Development of five new accessories for use in spectrographic analysis was announced recently by Bausch & Lomb Optical Co., Rochester, N. Y. All of these may be used with any spectrograph regardless of make or design.

Direct reading and continuous recording of density of lines in an analytical spectrum for determining quantitatively any element in the spectrum is possible with a densitometer. A spectrum plate aids identification of unknown elements in any specific material or specimen. A safety arc and spark stand with live parts encased in a cylindrical chamber insures complete protection in using dangerously high voltages (110 to 15,000 volts) needed to burn the specimen in the arc for spectrographic analysis.

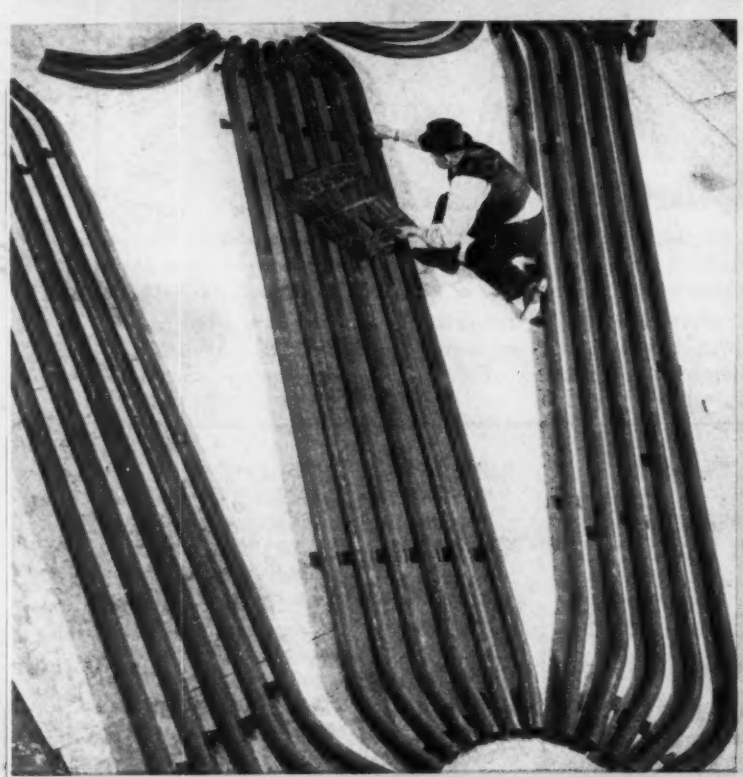
Electrode shaper with a rotatable turret is the first instrument of its kind on which different types of standard electrodes may be made without disassembling and reassembling the instrument. Briquetting press compresses powdered materials.

What's NEW about National S

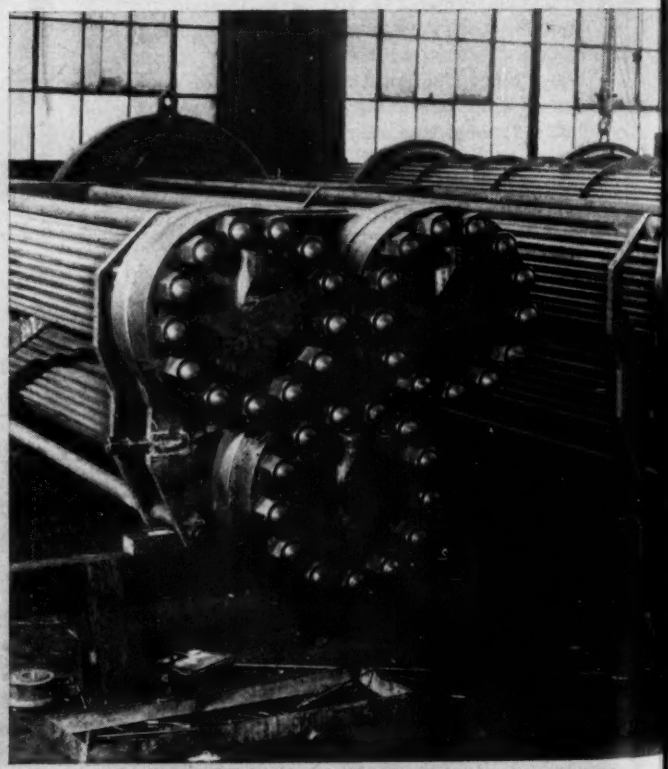


IN MODERN HIGH-EFFICIENCY STEAM LOCOMOTIVES

Modern steam locomotives have been making an average of 25,000 miles a month. National Seamless Boiler Tubes keep many of them on the job longer with less time in the repair shops.



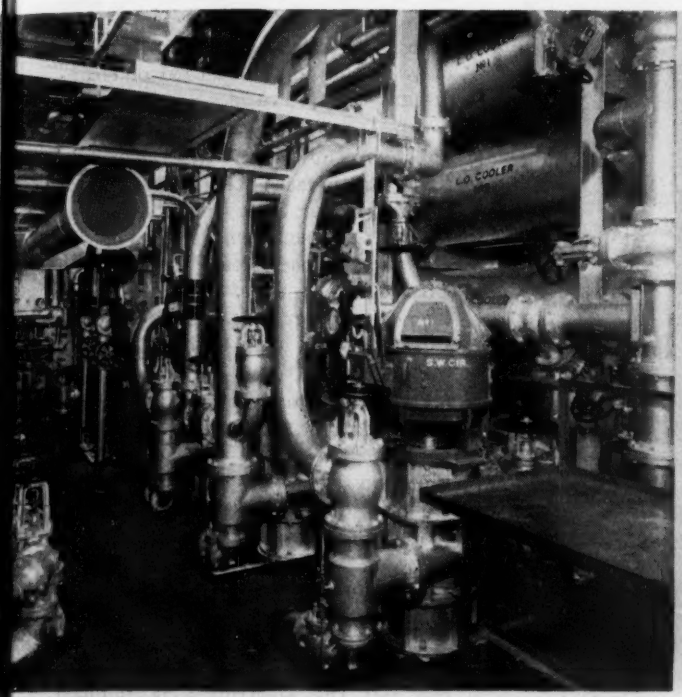
IN NEW "SUPER" POWER PLANTS. National Seamless Boiler Tubes are being made to operate under ever-increasing temperatures and pressures. Higher strength alloy steels with greater resistance to corrosion and erosion have been developed—and the seamless process assures uniform high wall strength throughout the length of the tube.

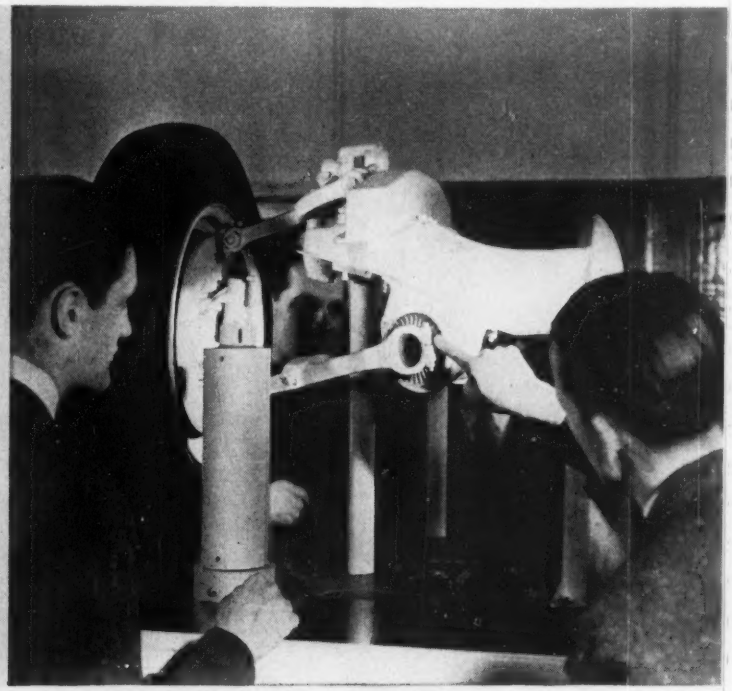


IN HEAT EXCHANGERS, CONDENSERS, SUPERHEATERS, COOLERS, ETC.

The ideal heat transfer apparatus calls for thin-walled tubes with smooth surfaces that offer the least resistance to the flow of heat, the maximum resistance to pressure, and surfaces that can be easily cleaned. National Seamless Steel Tubes with their wide variety of alloys, are best fitted for these applications.

Seamless Pipe and Tubing



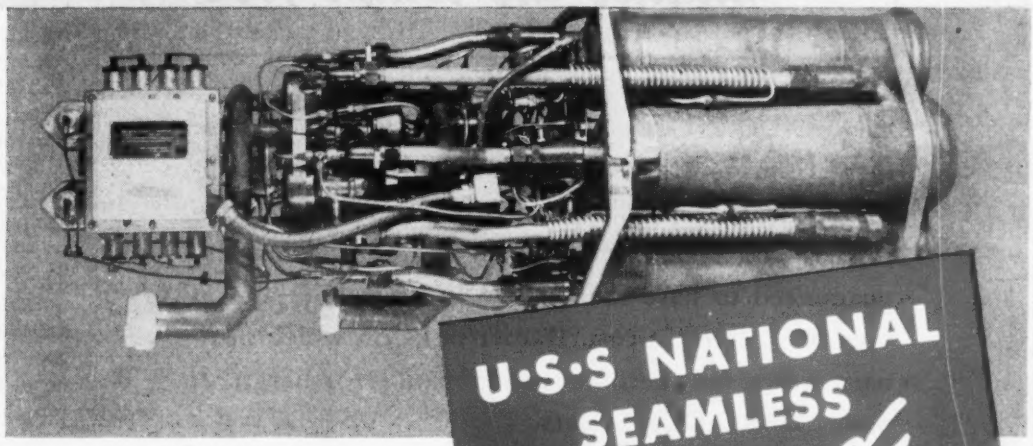


IN FAST CARGO SHIPS. U·S·S National Seamless Steel Pipe is used for main steam piping and exhaust lines; in boiler feed and fresh water lines; in fuel oil service and transfer lines; lube oil lines; refrigeration piping; in bilge and ballast lines, in fact wherever reliability demands the best.

IN THE NEWEST AUTOMOBILES. The "velvet glide" has been achieved by bonding a cylinder of rubber to two cylinders of metal, the inner tube of which is a seamless steel tube, to form the "Torsilastic" spring, developed by one of the large rubber companies.* The new spring needs no oil and is unaffected by dirt and water. It makes every road a smooth road. * Name on request.

IN JET PLANES

The burning, searing flame ate the steel of the combustion chamber until a special stainless steel tube was developed that would stand the high temperature and the corrosive action of the gases. U·S·S Seamless Stainless Tubing is used in the heart of this jet engine* that develops 6000 pounds thrust. *Reaction Motors, Inc., Dover, N. J.



U·S·S NATIONAL SEAMLESS *Pipe and Tubing*

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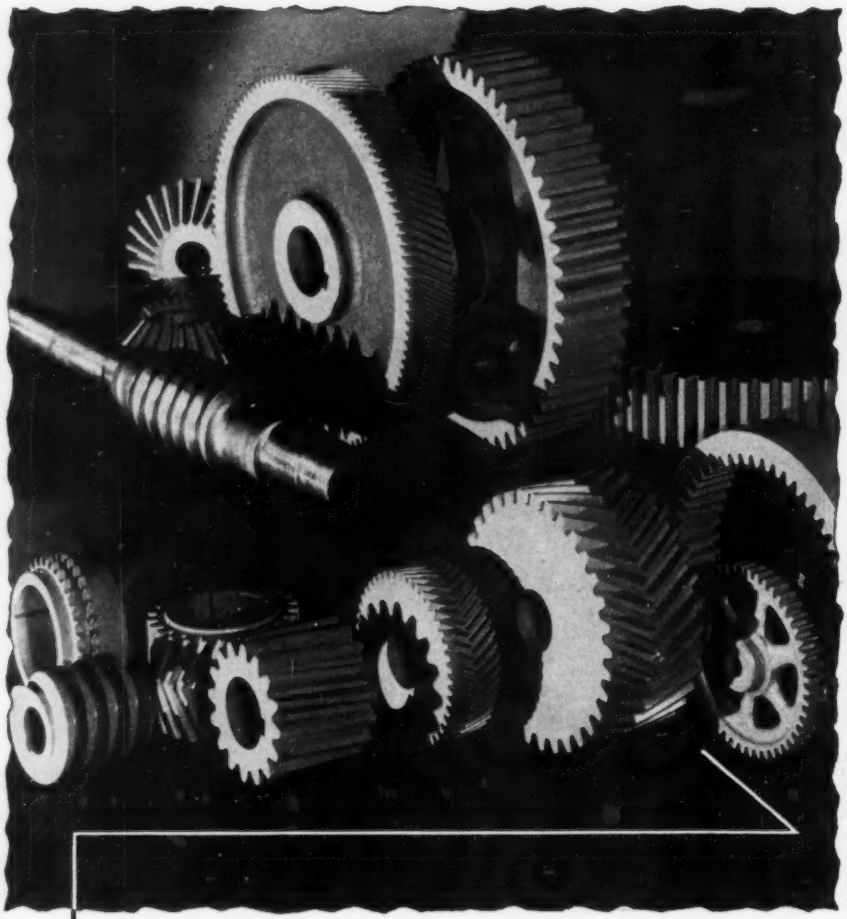
UNITED STATES STEEL



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"HARD-DUR" Gears preserve the tooth form because they are made of the finest gear steels and are scientifically heat treated. They are so much more wear-resistant than similar untreated gears that they are guaranteed to have four to five times the life and at only 50% extra in cost. Harder tasks on which ordinary gears fail become easier with Horsburgh & Scott "HARD-DUR" Gears.

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Electroplaters' Society

(*Continued from Page* 106)

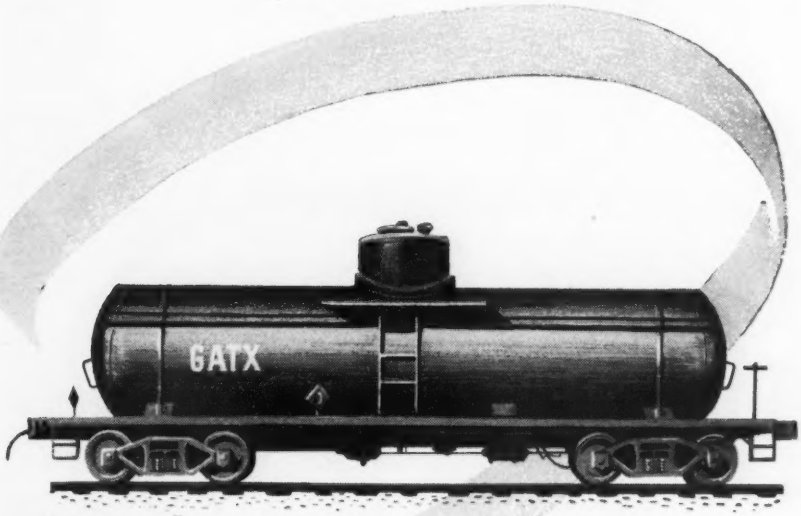
sludge formed in the bath, (2) the formation of the hydrogen blanket on the piece during treatment, (3) the time required for formation of a satisfactory coating, (4) the quality of the coating, and (5) the loss or gain in weight of the treated piece. The change in weight during phosphatizing depends on the method of cleaning and the acid ratio.

"Metal Cleaning"—George B. Hogaboom. This paper will deal with the soils present on metals to be cleaned rather than with the cleaner itself, the effect of soils upon cleaners, and the best cleaners to be used with different soils. It is also intended to describe a simple test for surfaces that are both chemically and physically clean.

"A Circulating Electrolyte Cell for Strip Plating Evaluation" — R. A. Dimon. The paper describes in detail two types of circulating electrolyte cells which have been used extensively by the author to correlate tests on small batch of electrolyte with commercial strip plating operations in which the strip being plated is being moved through the electrolyte at a high rate of speed. In the cell the electrolyte is pumped between the anode and cathode at a speed corresponding to the corresponding rate of strip travel. The means used to control rate of circulation, temperature and current will be dealt with. A resistance melting unit is to be described in which the melting conditions used in commercial tin plating lines are being duplicated, as well as a reflectometer by which the luster of the strips is measured. To illustrate the use of the equipment, data are given on the effect of such variables as solution flow, electrolyte temperature, tin and glue contents in the acid tin electrolyte described by Pine.

"Bright Barrel Plating of Nickel and Zinc" — Leonard A. Chesworth. This paper will include a description of a barrel plating production unit for the plating of bright nickel on small parts to controlled thicknesses of up to 0.00075 inch which are to be chromium plated. The operating conditions, control methods, and purification procedure being used on a production installation will be detailed. The paper will also describe a bright zinc barrel plating production unit which includes continuous electrolytic purification and a mechanical refrigeration system.

"Plating Copper-Zinc Alloys" — A. Kenneth Graham. This paper is a report on the electrodeposition of cop-



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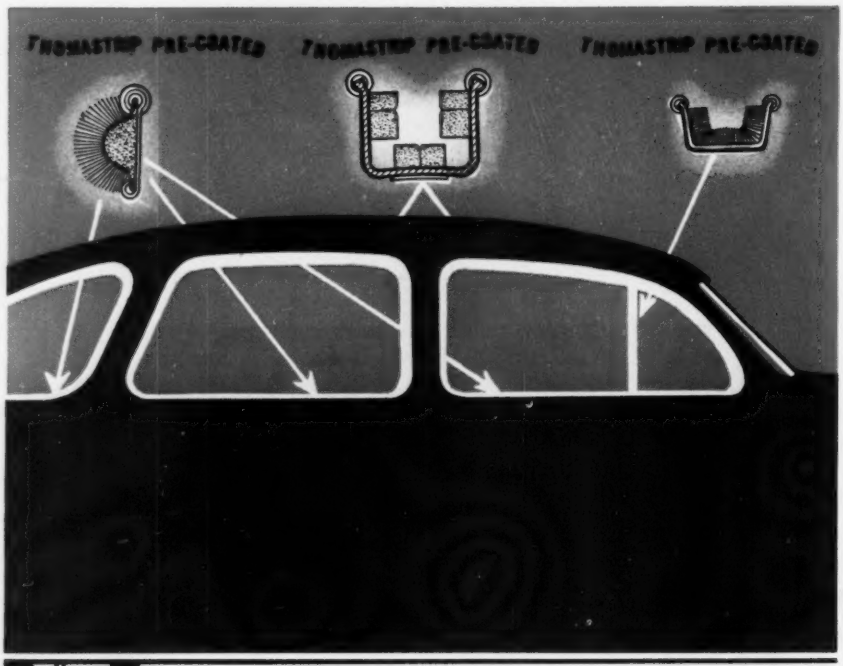
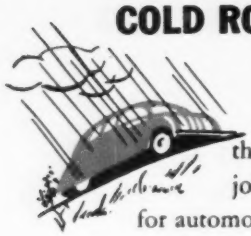


GLASS RUN CHANNEL and WEATHERSTRIP SECTIONS MADE OF PRE-COATED COLD ROLLED STRIP STEEL



A manufacturer with nation-wide distribution through automobile manufacturers, automotive jobbers and glass shops uses pre-coated ThomaStrip for automotive glass run channel and weatherstrip.

Where parts are not visible after assembly, electro zinc coated cold rolled strip steel is used. To give improved appearance where any surface is exposed, zinc coated ThomaStrip, pre-coated with black lacquer, has been adopted.

The use of ThomaStrip has been broadened by Thomas co-operation with manufacturers who wish to reduce costs and improve their products. Let us share our experience with you.

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COLD ROLLED STRIP STEEL SPECIALISTS

per-zinc alloys from cyanide plating baths taken from an extensive investigation over a period of twelve years. The author will review the results of published work on this subject and compare them with the results of his investigation. The paper will describe the deposition of copper-rich copper zinc alloys and cover the various bronze colors of interest in metal finishing. These alloys can now be plated at relatively high current densities with excellent control of the composition.

"Deposition of Metals on Plastics Employing Reduced Copper Films"—Harold Narcus. A new practical method will be described for plating on nonconductive materials, especially on synthetic resins, employing reduced copper films in lieu of the presently used silver films. The advantages of the copper films over the silver films will be discussed in detail with particular reference to the quality of the plated plastic product, to the elimination of ever-present hazards encountered in the use of the more popular silver film, and to the economical aspects. The necessary techniques, solutions and equipment used in practice to produce strongly adherent and continuous copper films capable of receiving a good subsequent electrodeposit will be discussed.

"Judging the Quality of Plated Parts"—William M. Phillips and F. L. Clifton. In pursuit of means to determine what constitutes quality of plated parts for various uses, the authors have for many years inspected parts from all makes of automobiles in many locations in the United States and determined the thickness of plate on the same parts of General Motors cars. The results of these studies will be presented in chart form. Interesting data from special roof tests will also be presented. A new method developed to indicate the combined effect of stress-strain and brittleness will be demonstrated. The authors believe it of sufficient importance for inclusion in plating specifications.

"Practical Methods of Cost Finding and Estimating on Metal Finishes"—Adolph Bregman. Cost finding and estimating are the most important elements of the job or contract-electroplaters' business. They are complicated by the fact that most job platers do not have sufficient staff to analyze closely every one of the many jobs that they take in. So many jobs are in small lots that a complete breakdown might cost more than actually doing the work. Also, with the wide variety of work constantly moving through the shop it is extremely difficult to segregate

costs in the plating room. This paper will describe methods developed in practice among job platers in the New York district. In most cases the figures will be based upon cost of labor, but they also include tank-hour and barrel-hour, with due allowance for the cost of special materials such as precious metals, expensive nonmetallic coatings, etc.

"The Spiral Contractometer, A New Instrument for the Measurement of Stress in Electrodeposits" — Abner Brenner and Seymour Senderoff. In this paper will be described a new instrument for the measurement of stress in electrodeposits. The instrument is designed for use either in research or in routine testing. In the process of evaluating the instrument, measurements of stress in nickel plates and other deposits were made and will be discussed. Formulas for the calculation of stress will be derived, and a detailed discussion of the various formulas previously suggested included. The formulas most frequently used are to be compared and correlated, and the limits of applicability of each given.

"Engineering Planning in the Plating Room"—S. M. Martin. A general resume of engineering applied to layout and equipment in the plating room will be given, covering essential points to be considered when planning new plating room installations or revising or expanding existing facilities. Such items as layout, floor drains, tank ventilation, solution temperature control, equipment maintenance and safety will be discussed.

Test Show Aluminum Is Good Bearing Metal

Recent tests on aluminum bearing metal revealed that it can be used to advantage in the manufacture of aluminum clock plates carrying pivot bearings. Same highly accelerated running conditions used in testing other materials were used by a clock manufacturer in testing the aluminum bearing plates supplied by Reynolds Metals Co., Louisville.

For rapid completion of the test, a fly or wind wheel was used in place of the usual escapement, thus accelerating the unwinding period at a ratio of approximately 3600 to 1. The test ran in cycles for 28 days, equivalent to approximately 92 years of clock operation. Checks of the amount of play in the minute and second arbors at the end of the test showed that aluminum is as good as materials long considered standard for clocks, and in addition weighs less and offers resistance to corrosion.

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Those three qualifications spell the difference between *"Automatic" Sprinkler* systems of fire protection and other makeshift protective equipments. The qualities of Assurance, Approval and Acceptance must be earned the hard way and, for *"Automatic" Sprinkler*, that way has been through more than 55 years of pioneering in the design, manufacture and installation of equipment that, on record, affords the best in fire safety.

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"6 in 1"
SIX POINTS OF SUPERIORITY IN ONE

1. MULTICYCLE STRAIGHTENING—Two bending rolls impose duplex straightening cycles on workpiece insuring end to end straightness.
2. POSITIVE AND SYNCHRONIZED FEED—All four feed rolls are driven insuring positive synchronized feed and torque balanced around neutral axis of workpiece.
3. THE WORKPIECE LEVEL—Maintains one feeding level for all sizes of pipes or tubes—eliminates need of adjustable entry and delivery tables.
4. NO GUIDES—Horizontal position of the six rolls with balanced torque eliminates requirement for guides.
5. SINGLE MOTOR—All four driven rolls powered from a single motor, for synchronization and economy.
6. NO BEVEL GEARS—All gears enclosed in cases and running in oil, for sure trouble free operation.

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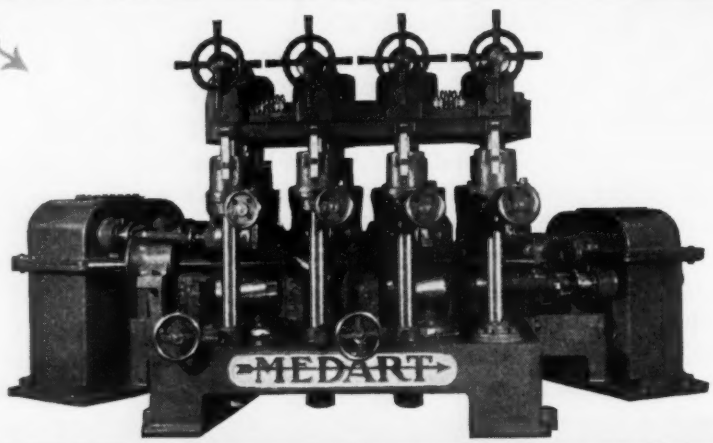

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Titanium Enamels

(*Continued from Page* 111)

blow is struck on the turned edge of an enameled sheet.

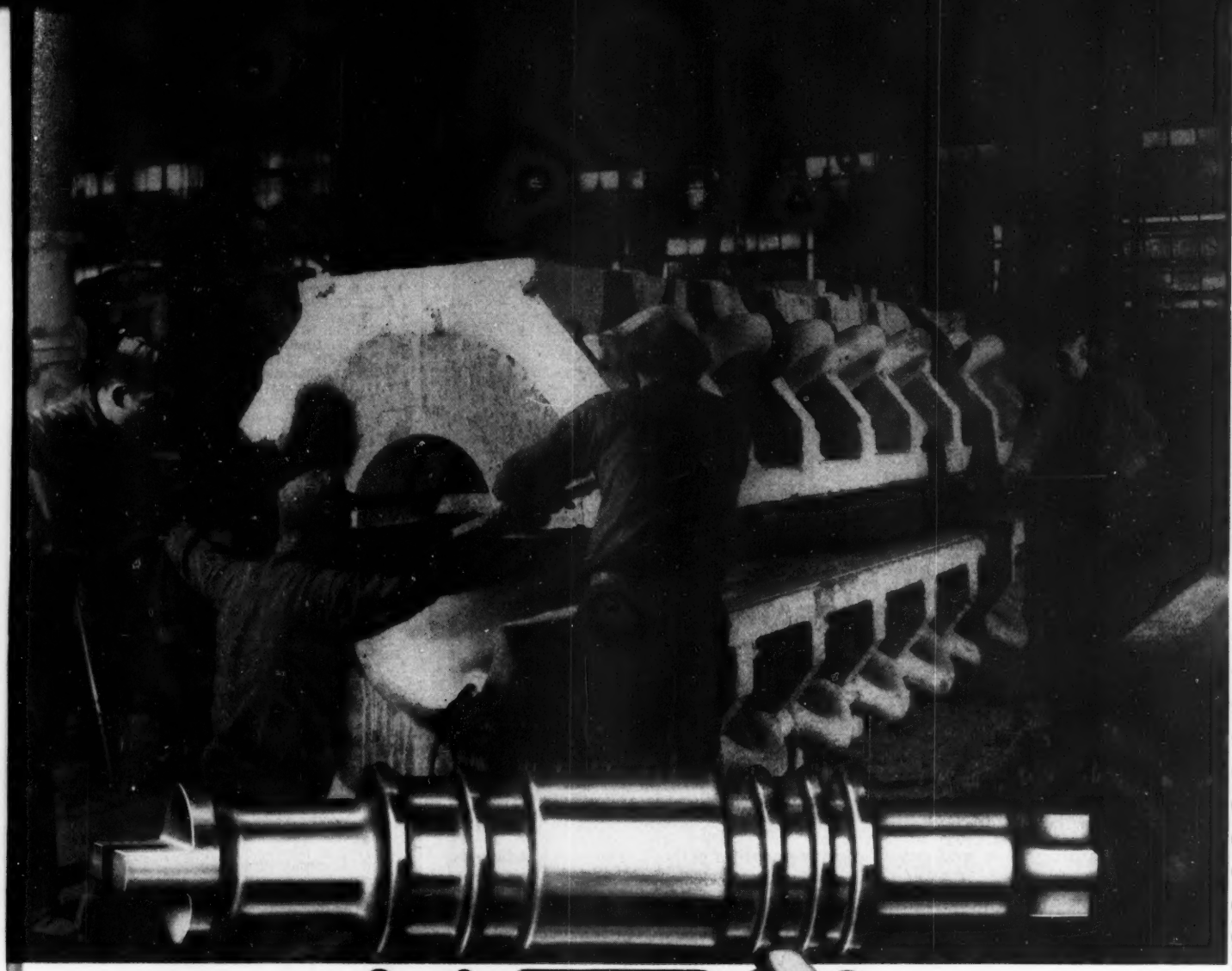
Thermal Shock—In contrast to these results are the data obtained when an enameled article is subjected to thermal shock and thermal distortion[10], or mechanical twisting.[11] Some thermal distortion data are given in Fig. 3. In the thermal shock test, an enameled pan is heated and quenched in water. Each cycle is rendered more severe than the previous one by heating the pan hotter each time before quenching. The test is continued until 15 cycles have been completed or the pan fails. In the case of thermal distortion, an enamel shape was subjected to uneven heating. The piece was forced to bend and the amount of deflection necessary to produce failure was recorded. When a sheet of enamel is bent, the thinner the enamel the more bending it will stand. This effect is more pronounced when the enamel is applied on very light gage steel. Some data of this type are given in Table II. These latter tests all indicate that the thinner the enamel the more serviceable the enameled article.

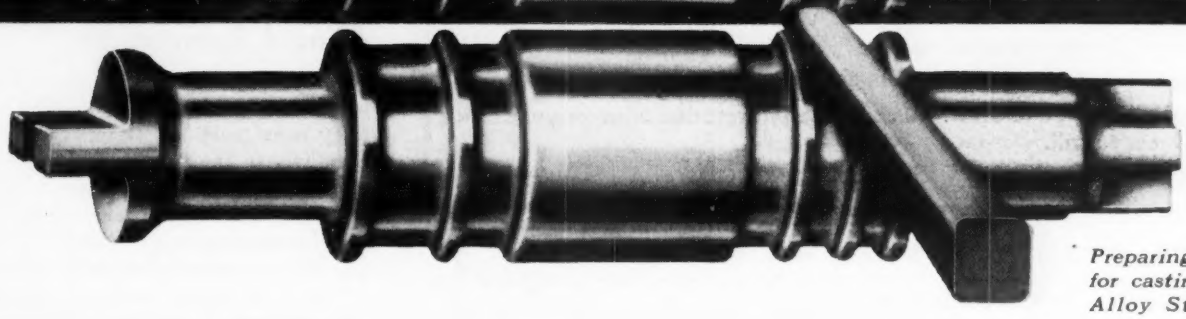
TABLE II
FLEXIBILITY OF ENAMELED SHEET IRON
(All samples were enameled on both sides)

Gage of Iron	Thickness of Enamel Per Side in Mils	Radius in Inches of Bend Necessary To Produce Failure
20	.0023	8.0
	.0033	9.1
	.0040	10.6
	.0085	11.8
32	.0015	2.3
	.0030	3.2
	.0063	5.2

Explanation of the whole matter seems to be this. Where flexibility is desired, the thinner the enamel the better. Where strength and rigidity are required a thicker enamel will help, but it should be remembered that such an article will have a brittle coating. A better solution where greater strength is required is to use a heavier base metal.[12] It is also desirable when designing articles which are to be coated with porcelain enamel to eliminate sharp radii wherever possible. Figs. 4 and 5 give the effect of increasing metal thickness and radii on corners as a means of increasing impact resistance.

Successful use of porcelain enamel is largely a question of design. The properties of enamels and the use to which the enameled article is to be subjected should be understood before the article is designed. Enam-





Preparing the mold for casting Phoenix Alloy Steel Rolls

PHOENIX ROLLS FOR THE BLOOMING MILL

Whether of plain carbon steel for extreme strength, or of Phoenix "A" Alloy Steel where unusual wearing qualities are desired, Pittsburgh rolls will produce blooms, billets, and slabs *at less cost per ton of steel rolled.*

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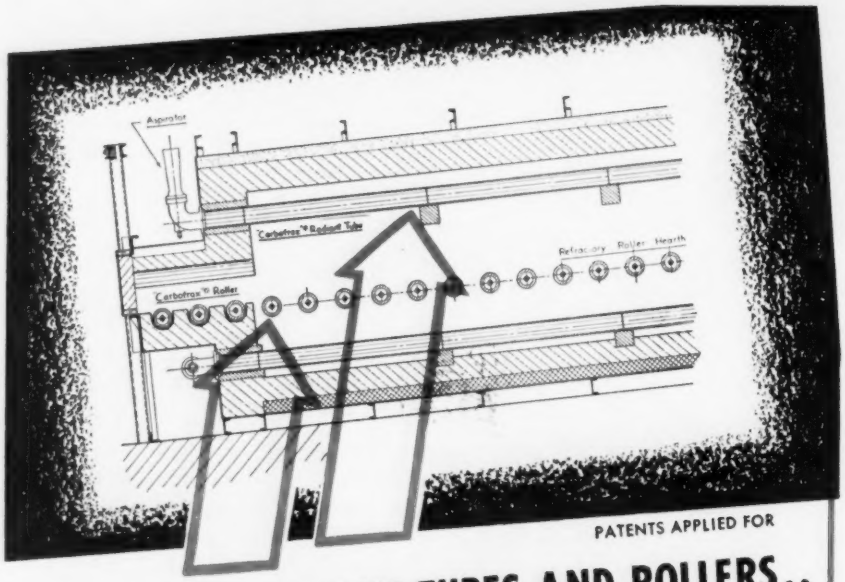

PATENTS APPLIED FOR

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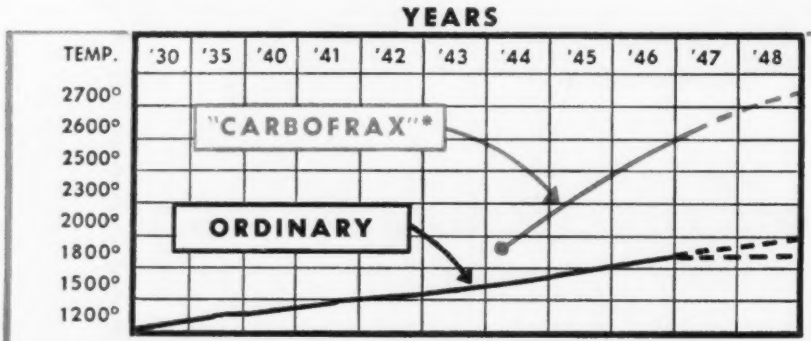
"CARBOFRAX"* Radiant Heating Tubes and Rollers are not only reducing heat treating costs in conventional furnace operations — but also achieving temperatures up to 2500° F. in special and protective atmospheres with radiant gas heat.

Laboratory tests and actual plant operation prove these outstanding advantages of "CARBOFRAX"* Tubes and Rollers in GASMACO Industrial Furnaces:

- Lower initial cost—longer life
- Operation up to 2500° F.
- High heat transfer and fuel efficiency
- High hot load strength without oscillation
- Freedom from "crankshafting"
- Gas-tight operation
- Low heat loss through insulated water cooling

We shall be glad to send you complete information or arrange for an engineer to call.



Development of high operating temperatures with "CARBOFRAX"* as compared with ordinary tubes and rollers. Because these high temperatures are economically practical, new fields are being opened in heat treating with gas fired roller hearth radiant tube furnaces.

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els with a wide variety of properties are available.

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Welding Society Holds Annual Symposium

Annual symposium of the Cleveland section, American Welding Society was held at Hotel Cleveland May 14. In the first paper presented at the technical session, Lew Gilbert, Champion Rivet Co., Cleveland, stated that eliminating causes for poor welding will do much to lower costs.

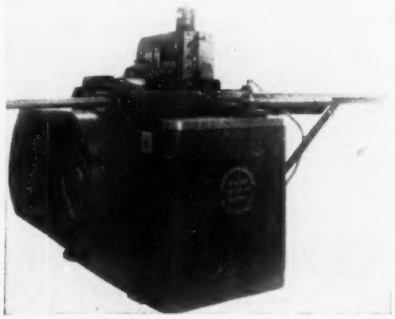
Too much of the welding information, he said, is written in language that the welder does not understand or else is not available to him. Management needs to teach the science of welding as well as the art of welding, he stated, so that the operators will be able to handle jobs that differ from those that they have been doing regularly.

Method of bonding stainless to mild steel and instructions on fabricating by welding were included in a paper presented by L. C. Grimshaw, Jessop Steel Co., Washington, Pa. Concluding the technical session was a discussion of the use of a submerged arc automatic welding head conducted jointly by Paul W. Arnold of Reliance Electric & Engineering Co., and L. K. Stringham, Lincoln Electric Co., both of Cleveland.

New Products and Equipment

Tube Cut-Off Machine

Tubing of any diameter or wall thickness may be cut in less than 1/3-second per cut, providing it is within the range of the cut-off machine made by Grieder Machine Tool & Die Co., 324 North Maple St., Bowling Green, O. Cycle of the ma-



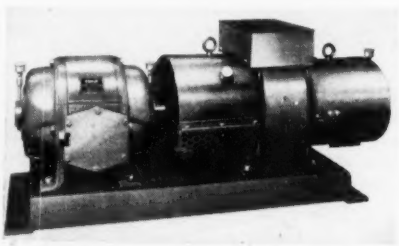
chine is 12,000 cuts per hour. Cutting time for various sizes, shapes and wall thicknesses is the same. Interchangeable dies allow change over from one diameter size to another in a minimum of time.

Features include: Cutting with a minimum of burr; fully automatic or manual operation; cuts with no tube distortion; cuts very accurate for length; positive lubrication to moving parts; any desired length can be cut by adjusting the stop; if tube is not fed its proper distance, the machine will not operate.

Check No. 1 on Reply Card for more Details

Motor Generators

A line of high frequency motor-generators with output frequencies of 300-400 cycles and size ranges from 1 to 250 kilowatts is announced by Bogue Electric Mfg. Co., 40 Iowa Ave., Paterson 3, N. J. Use of the



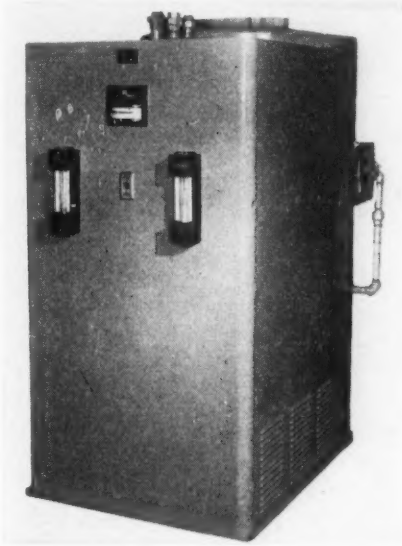
equipment may be for operation of high speed machine tools and motors.

High frequency power permits operation of tools at high speeds and also allows for developing higher speeds from lighter weight equipment of simplified construction. Motor-generator sets can also be used as a source of high frequence alternating current for general and laboratory use.

Check No. 2 on Reply Card for more Details

Endothermic Generator

An automatic endothermic generator which produces a gas that is protective to steels and which makes possible clean and bright hardening in properly constructed furnaces is



announced by Ipsen Industries Inc., 311 Blackhawk Bldg., Rockford, Ill. The addition of small amounts of certain gases produces a clean carburizing atmosphere. Small amounts of ammonia added to the enriched gas produces a gas cyaniding atmosphere.

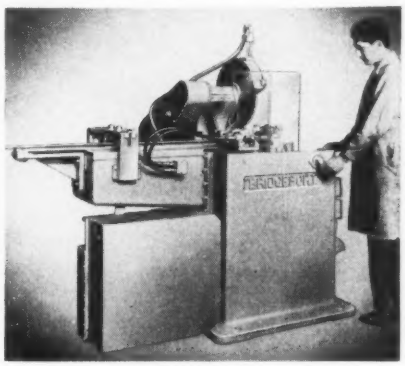
In producing the gas, air and raw gas are drawn through flow meters, accurately proportioned and pumped through a fire check into the externally heated and catalytic cracking retort. Upon cooling the endothermic processed gas can then be piped and metered to one or more furnaces. Once proportioning is set, generator is completely automatic.

Check No. 3 on Reply Card for more Details

Abrasive Cut-Off Machine

Fully automatic, an abrasive cut-off machine, built by Bridgeport Safety Emery Wheel Co., Stratford, Conn., is designed for high speed cutting off of stock up to 2 inches square to lengths ranging from ¼ to 12 inches. Steel, brass, plastics and porcelain are among the materials which may be cut with the model 51 machine.

Head assembly, consisting of an 18-inch abrasive cut-off wheel driven through V-belts by a 10 horsepower motor, is mounted on a rocker shaft running in Timken bearings and is actuated by a hydraulic cylinder which feeds the wheel in and out of the cut. Hydraulically operated

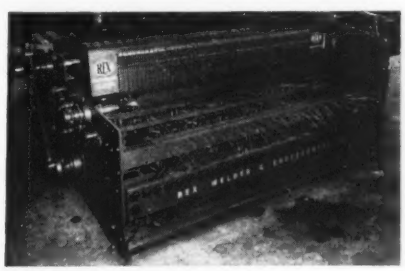


feed mechanism is synchronized with cutting head and automatically feeds a predetermined length of stock into position where it is gripped by a vise. After cutting the wheel withdraws, the feeder returns to normal position and cycle is repeated automatically.

Check No. 4 on Reply Card for more Details

Multiple Welder

Specially designed, the latest model Multi-Welding machine, built by Rex Welder & Engineering Co., Kansas City 8, Mo., has an overall welding width of 112 inches and is equipped with two slitters and two trimmers. It is set for three finished rolls 36 inches wide and has a range of from 18 to 12 gage. Welding heads or transformers are arranged so that spacings of 1 x 1 inch and larger can be secured with a minimum of change. The longitudinal and trans-



verse wires can be increased by increments of 1/2 and 1 inch, respectively.

Welder is equipped with fifty-six 10 kilovolt-ampere, 440-volt, water cooled transformers, each with its own heat control switch with three tap settings. Heat is further controlled by three Westinghouse syn-

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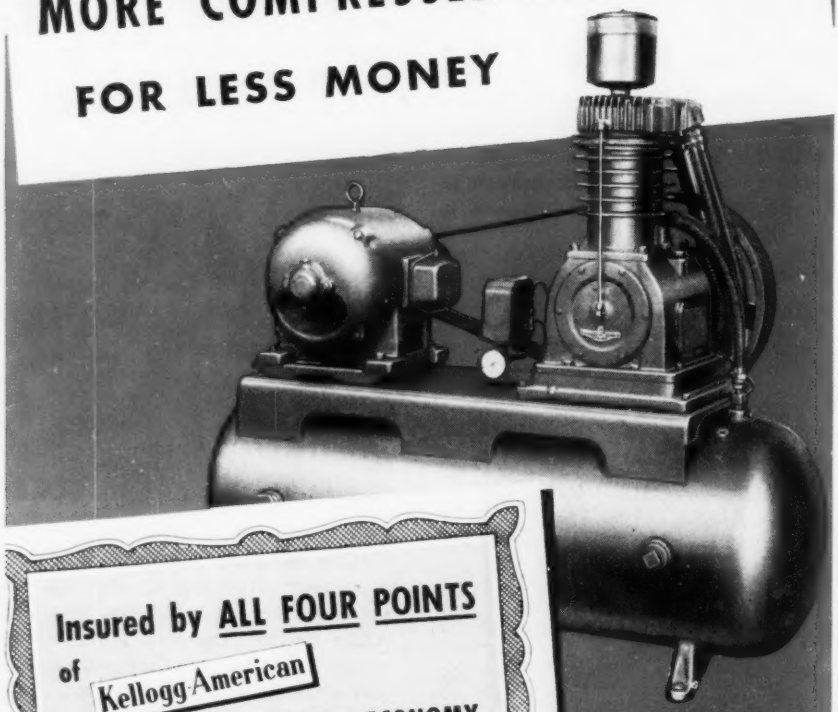

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plus
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Write for information and literature. American Brake Shoe Company, Kellogg Division, Rochester 9, N. Y.

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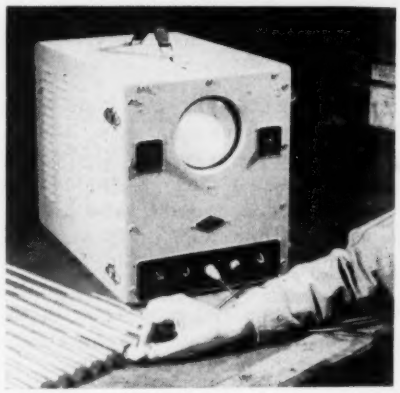
AMERICAN Brake Shoe COMPANY KELLOGG DIVISION

chronous panels which include phase shift heat control. Unit is operated by a 15 horsepower motor and actual welding speed is better than 60 welds per minute. Average production of finished mat is about 45 square feet per minute on 1 x 1-inch mesh. Wind-up or baler has an individual friction drive which maintains a constant tension.

Check No. 5 on Reply Card for more Details

Nondestructive Tester

Type SRO5 supersonic Reflectoscope, announced by Sperry Products Inc., 1505 Willow Ave., Hoboken, N. J., is used for nondestructive testing of metals and other materials for internal defects and for testing welds. Redesigned device has a reduced size of 14 x 16 x 23 inches and is carried



by means of handles. Five external controls allow operator to vary sensitivity, pulse width, sweep length, screen markers and frequency.

Visual indication of internal defects remains unchanged on the oscilloscope screen, but the tube is smaller, 5-inch, high intensity type. Weighing approximately 85 pounds, the instrument facilitates testing of manufactured products from raw materials to finished stage and its portability allows its use in the field.

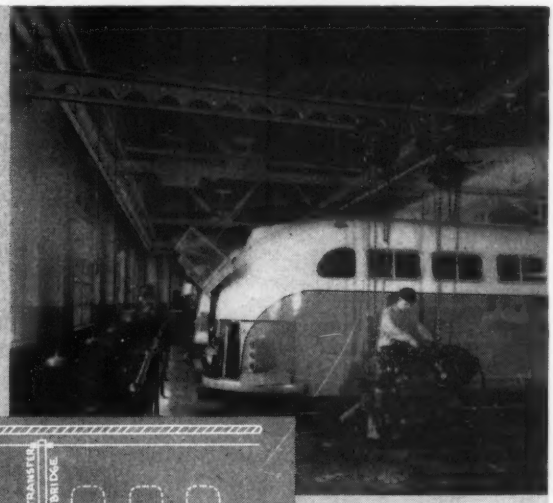
Check No. 6 on Reply Card for more Details

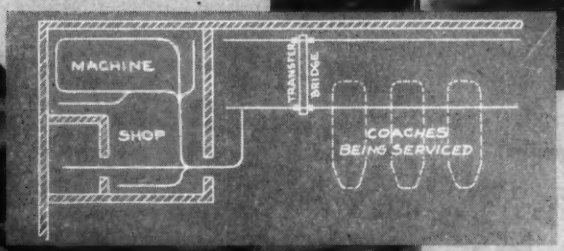
Electric Hoists

Made entirely of steel forgings and castings, the new 3 and 5 ton Bob-Cat electric hoists, made by Lisbon Hoist & Crane Co., Lisbon, O., have ball bearings throughout. Gears are of heat treated alloy steel. Smaller overall dimensions are obtained by mounting the motor on inside of cable drum.

Hoists are made in three sections, permitting complete and easy access to any part by the removal of four bolts. Both models have a safety factor of 6 to 1. Lightweight units

Tramrail System Aids Greyhound Coach Repairs





As indicated in diagram, the Tramrail transfer bridge in photo above may be interlocked with a rail extending from machine shop, making it easy to deliver loads like this engine to shop without rehandling.

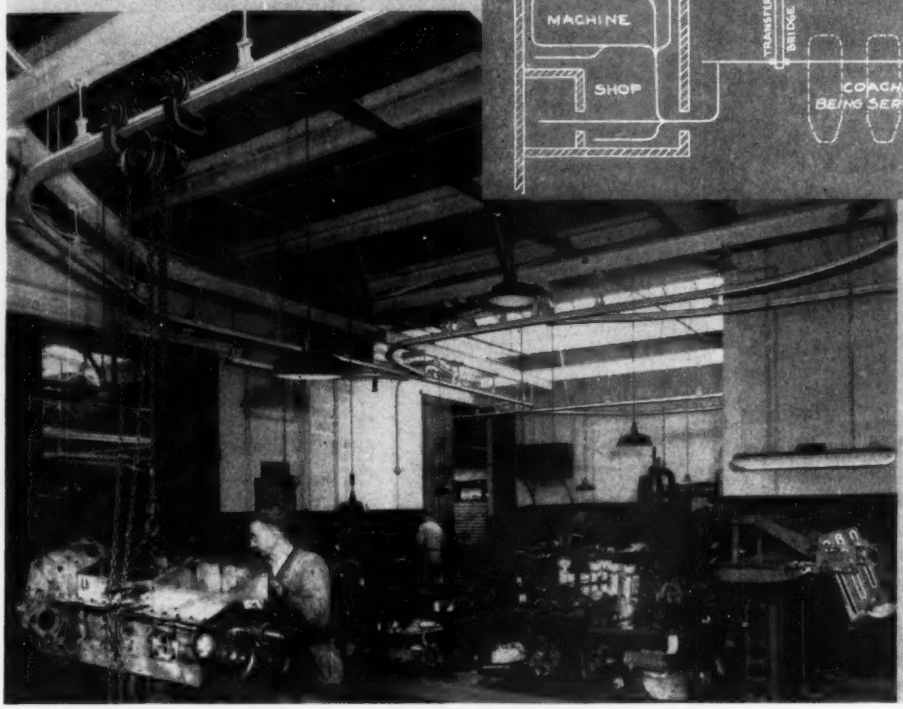


Photo at left shows how Tramrail track with switches and curves provides necessary hoisting and conveying service in machine shop.

More than 100 modern Greyhound Coaches are kept in tip-top condition by the Syracuse, N. Y., shop of Central Greyhound Lines, Inc. of New York. To facilitate the handling of engines and other heavy parts in and out of the coaches and in the up-to-date machine shop, a simple Cleveland Tramrail hand-propelled system is provided. This includes standard overhead rail with switches and curves to adequately cover all points where lifts must be made.

The track from the machine shop passes through a doorway and extends to the runway of an overhead traveling Tramrail bridge which may be interlocked with it. The arrangement is such that an engine can be removed from a coach and transported via the overhead system directly to the machine shop without rehandling.

This is one of 30,000 Cleveland Tramrail installations. Regardless of what your materials handling problem is, most likely we have already solved dozens of similar ones.

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THE CLEVELAND CRANE & ENGINEERING CO.
7830 EAST 284TH ST. WICKLIFFE, OHIO

CLEVELAND TRAMRAIL
OVERHEAD MATERIALS HANDLING EQUIPMENT

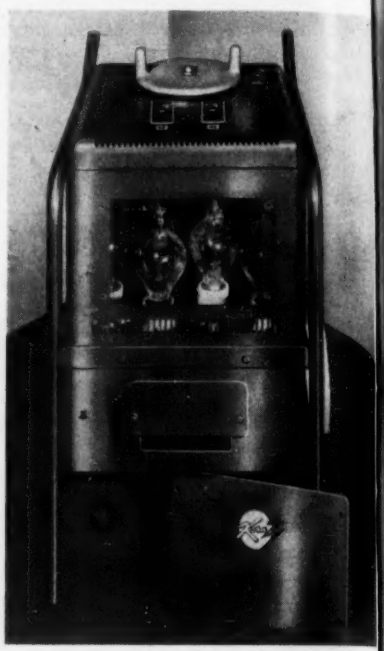
have one of three types of controls: Pushbutton; hand control on pendant cable, controlled by pressure on a small thumb lever; and two pendant ropes with handle on end of each. Both are equipped with equalizing solenoid and mechanical brakes.

Check No. 7 on Reply Card for more Details

AC-DC Welder

Arc of the Duel-Tronic combination alternating-direct current welder, made by John A. Kern Co., 224 North Loomis St., Chicago 7, Ill., may be set for alternating or direct current operation by setting two switches and a hand lever. For direct current operation, it used rectifier tubes installed in a flexible mounting. Idling losses are cut 50 per cent, power consumption under load is decreased and maintenance costs reduced. Instant arc response eliminates surging and electrode spatter.

Welds on light gage metals, including stainless steel, are uniformly good, as the accurately controlled low voltage eliminates excessive heating. Arc is easy to strike and ho even with electrodes as small 1/32-inch. Metal as light as 32-ga can be welded without burni through. Two dual-range models a offered, with alternating and dire

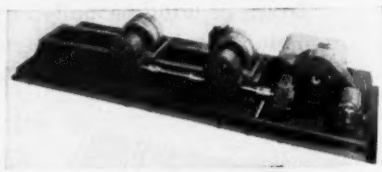


current ranges of 25 to 200 and 5 t 60 amperes (model 20 DA) and 2 to 200 and 5 to 90 amperes (mode 25 DA). Models 60 D and 90 D hav straight direct current ratings of to 60 and 5 to 90 amperes, respectively.

Check No. 8 on Reply Card for more Detail

Turning Roll

Tanks and other cylindrical shapes may be rotated for either manual o automatic welding, flame cutting painting, etc., with the model 12 turning roll, built by Reed Engineering Co., 1003 West Fairview Ave., Carthage, Mo. Power unit con-



sists of two synchronized driving wheels, rubber tired, equipped with antifriction bearings and powered by a ¾-horsepower motor. Idler units also are made.

Work up to 12 feet in diameter may be handled. Capacity for one power and one idler unit is 12,000 pounds; for one power and two idler units, 18,000 pounds. Worm gear reduction drive is totally enclosed. Variable speed drive gives speed from 5

HERE'S WHAT OTHER STEEL MEN SAY ABOUT BUCKEYE SILICA FIRESTONE
"We get over 50,000 tons per lining in an 80-ton ladle. After lining has been in service two weeks, we can pour hot metal on cold lining... frequently drop heavy pig into ladle. Buckeye Silica Firestone lasts longer . . . and costs less."
--- Steel Plant in Pennsylvania
"We get 75,000 to 80,000 tons out of a hot metal ladle (125-ton capacity)."
--- Steel Plant in Pennsylvania
"We get about four years service from Buckeye Silica Firestone as compared with two years with-------."
--- Steel Plant in Illinois
"We wish to advise that the Buckeye Split Rock Linings have worked out very satisfactory and we will use this material again when we are in the market."
--- Steel Plant in Canada
"During the past three years we have rebuilt soaking pit walls of competing material twice, but the stone is still good and will be for some time."
--- Steel Plant in Michigan
"We are using Buckeye Silica Firestone in soaking pits . . . for the reason that we have found that it lasts much longer than other materials. By the use of firestone we have overcome the squatting and shrinking of the walls in these pits due to the fact that this material does not soften and shrink."
--- Steel Plant in Pennsylvania

For further information, write

THE CLEVELAND QUARRIES COMPANY

1740 East Twelfth Street CLEVELAND 14, OHIO

BUCKEYE

"FOR THAT EXTRA SERVICE"

SILICA FIRESTONE

to 40 inches per minute. Reversing drum control and 30 feet of flexible control cable for remote operation are included. Tachometer, foot operated switch and remote speed change control are optional.

Check No. 9 on Reply Card for more Details

AC Arc Welder

Class B insulation, best grade electric steel and a maximum of high conductivity copper are features of the Nu-Arc alternating current arc welder, manufactured by Electric Arc Inc., 152 Jelliff Ave., Newark 8, N. J. A wide range of current steps

with high and low welding range terminals is provided. An unrestricted air flow keeps operating temperatures low.

Welder, made in three models, is enclosed in heavy gage metal housing with full-view control panel. Standard primary equipment is wound for operation on 220/440 volts, standard frequency, single phase alternating current. Power factor correction and high frequency units are special equipment. Welding ranges of 15 to 200, 15 to 250 and 30 to 350 amperes are specified for the models.

Check No. 10 on Reply Card for more Details

Carboy Truck

Handling of dangerous chemicals or any liquid encased in a carboy is speeded up by a new carboy truck designed by Palmer-Shile Co., 16025 Fullerton Ave., Detroit 27, Mich. Truck is rolled against the carboy and the gripping yoke is dropped over the top. The truck handles are pulled back and loading becomes automatic.

Hardened steel studs on the truck

Presto

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PRESTO UNIVERSAL BACK STAND IDLERS ALSO AVAILABLE

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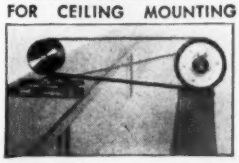
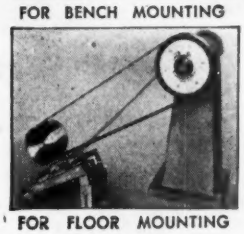


FOR BENCH MOUNTING



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Here's real convenience and economy . . . the Presto Back Stand Idler will fit most available space . . . and is adjustable to run close to equipment with a short abrasive belt or to extend to use a standard 168" abrasive belt . . . depending upon your requirements. This adjustment can be made quickly without moving the base.

The Presto Back Stand Idler is of sturdy, all-steel, vibration-free construction . . . equipped with double-sealed precision ball bearings. It can be changed easily from right to left by loosening two set screws and reversing shaft. Adjustable belt tension is maintained by six leaf-type springs. You'll find its initial cost very economical and its performance is "tops". Send today for complete descriptive literature.

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The Presto Contact Wheel is of outstanding quality that gives fast, smooth, uniform cutting. Made of tough synthetic rubber, the even density of the face of the wheel is uniform throughout . for toughest snagging jobs or finest polishing. Available with *soft, medium, hard and extra hard* density.

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• METAL FINISHING SUPPLIES AND EQUIPMENT •

frame hold the load in place. To unload the truck is tipped forward and the gripping yoke released. It is of all steel welded construction. Overall width is 20 inches and overall length is 48 inches. Two 2 x 8 inch roller bearing wheels have either rubber, pneumatic or metal wheels.

Check No. 11 on Reply Card for more Details

Sand Conditioner

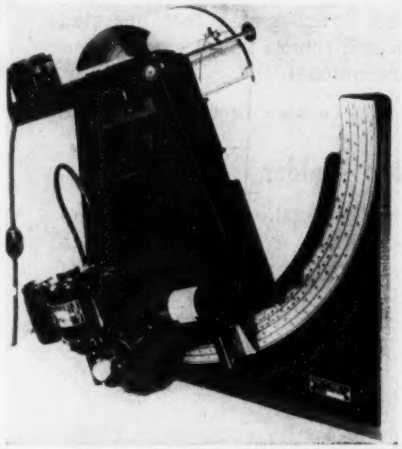
Hydraulic power controls and directs the movement of the ramming arms of the Hydra-Slinger stationary type Sandslinger, built by Beardsley & Piper Division of Pettibone Mulliken Corp., 2424 North Cicero Ave., Chicago 39, Ill. It is designed to provide maximum production in molding units where the flasks and patterns move into the ramming area.

From the control station the operator directs the movement of the ramming head over the mold with ease and accuracy and at a speed higher than any other Sandslinger. Station may be placed at a choice of locations adjacent to the ramming area and may be at floor level or elevated to provide the most desirable visibility for the particular installation. Various arm lengths provide a choice of ramming ranges. Two models are made, both with 10 to 15 feet overall arm length ranges and with 7 to 10 and 10 to 15 cubic feet ramming capacity ranges. Head sizes (which control density of ram) are 16 and 19 inches and 19 and 22 inches. Tip sizes (which control ramming capacity) are 4 and 5 inches.

Check No. 12 on Reply Card for more Details

Sand Deformation Recorder

Harry W. Dietert Co., 9330 Roselawn Ave., Detroit 4, Mich., is announcing a strength-deformation recorder which may be attached to its universal sand strength machine and used for either the green compressive strength test on the AFA 2 x 2 inch sand specimen of for the AFA core transverse strength test where a 1 x 1 x 8 inch baked core specimen is used. Recorder draws the stress-strain diagram on a printed chart ruled to show the pounds per square inch compressive strength or load for the core transverse strength.



Deformation is measured on the horizontal axis with a ruler reading to 0.001-inch deformation (compression test) and 0.001-inch deflection (baked core transverse test). The recorder, accurate to within 0.0005-inch, is driven by a synchronous motor normally in an electrically braked position. Deformation or deflection of specimen releases the brake, causing

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HI-GRADE METALLIC SHOT AND GRIT

FAMOUS
FOR ITS ABILITY TO STAND UP UNDER REPEATED HARD USE

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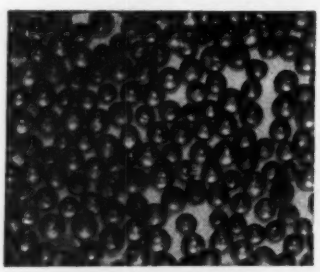
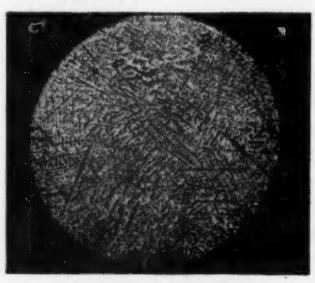
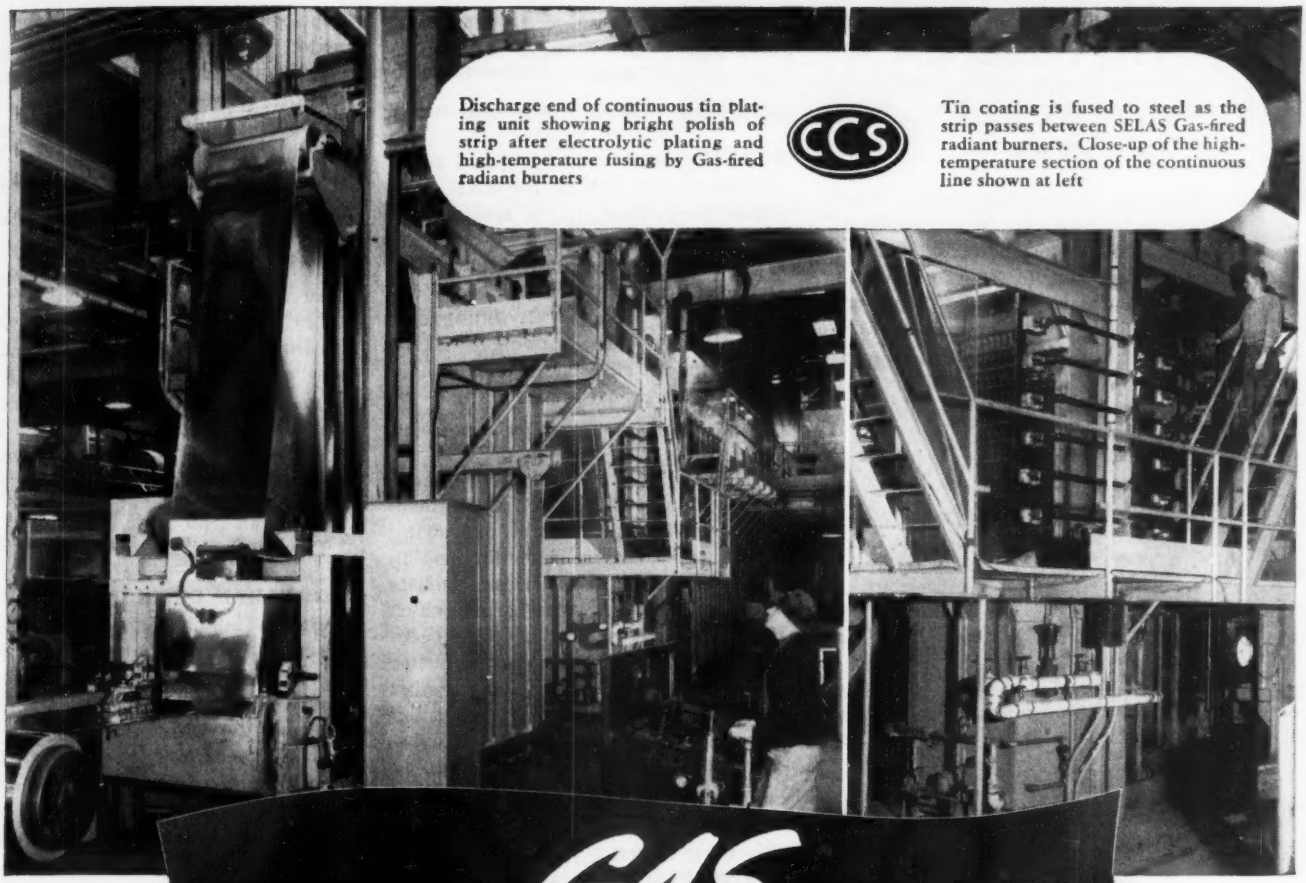


UNRETOUCHED PHOTO OF HI-GRADE SHOT

CLAYTON-SHERMAN ABRASIVES COMPANY
3896 LONYO ROAD
DETROIT 10, MICHIGAN
CEdar 7200



MICROSCOPIC STRUCTURE OF METAL



Discharge end of continuous tin plating unit showing bright polish of strip after electrolytic plating and high-temperature fusing by Gas-fired radiant burners

Tin coating is fused to steel as the strip passes between SELAS Gas-fired radiant burners. Close-up of the high-temperature section of the continuous line shown at left

RADIANT GAS BURNERS create high-temperature tin-coat fusing zone

BRIGHT FINISHING was the problem—and engineers of Crown Cork and Seal Company, Inc., Baltimore, adopted a high-temperature method for fusing tin to low-carbon strip, with resultant high-polish surface, in a continuous production mill.

Then, to obtain the high temperatures necessary for heat-processing, these engineers selected GAS and modern Gas Equipment. By directing the heat of radiant GAS burners over a concentrated area of the freshly-plated strip it was readily possible to coordinate the fusing action with the plating process to accomplish continuous high-speed production of bright finished strip.

This typical installation demonstrates the flexibility of GAS and the applicability of modern Gas Equipment for continuous, production-line heat processing. Compared with available fuels GAS is most readily controlled by simple automatic devices; Gas Equipment can be adapted for use with existing machinery or incorporated in new machinery without radical design changes, or expensive supplemental apparatus.

The manufacturers of Gas Equipment and your local Gas Company Representative will assist you and bring you up to date on the latest developments in heat-processing with GAS.

AMERICAN GAS ASSOCIATION
420 LEXINGTON AVENUE, NEW YORK 17, N. Y.

MORE AND MORE...
THE TREND IS TO GAS
FOR ALL INDUSTRIAL HEATING

pen to traverse either to right or left.

Check No. 13 on Reply Card for more Details

Pit Type Furnace

Made in 14 standard muffle sizes with work areas from 20 inches diameter and 20 inches deep to 36 x 60 inches, the lithium atmosphere pit type furnaces, developed by Lithium Co., 111 Sylvan Ave., Newark 4, N. J., heat treat such products as sheet metal, tubular shapes, forgings, gears, etc. Designed for heating operations to 2000°F, the furnaces provide automatically controlled conditions for carburizing, carbon restoration, annealing, neutral hardening, cycle annealing, normalizing and descaling. The lithium vaporizing unit is integral with the furnace.

Cylindrical furnace shell is of all welded reinforced steel plate, lined with insulating refractory brick. It is equipped with an alloy retort into which the work is placed. A motor driven fan provides constant circulation of the atmosphere in the retort. Gas burners are located on four levels. In electric furnaces, sinuous loop alloy ribbon elements are mounted on alloy hangers. Swing type furnace cover is hydraulically operated.

Check No. 14 on Reply Card for more Details

• • •

DRY TRANSFORMERS: Features of the improved line of type F dry transformers made by Marcus Transformer Co. Inc., Hillside 5, N. J., include use of class B heatproof insulation and class C materials, in conjunction with bare copper. Fire and explosion proof units have primary tap switches. Sizes from 100 to 1000 kilovolt-amperes, single or three-phase, in voltages to 15,000 volts are available.

Check No. 15 on Reply Card for more Details

FLARING TOOL: Soft copper, brass and aluminum tubing for SAE flare joints in ¼, 5/16, ⅜, ½ and ⅝-inch outside diameter sizes may be made rapidly by a flaring tool developed by Imperial Brass Mfg. Co., Chicago 7, Ill. Tool has die holder with sliding dies for clamping the tubing. Extra depth smooth surface die blocks hold tubing securely without scoring.

Check No. 16 on Reply Card for more Details

BOILER TUBE CLEANER: Lagonda Division of Elliott Co., Springfield, O., is producing an improved swing frame type cutter head for use in cleaning boiler tubes. Head consists of a spider fitted with arms which swing out on arm pins under centrifugal force. Arms carry cutter pins on which are sharp, heat treated cutters. Cone cutters in front engage thick accumulations. Following star cutters polish the tube.

Check No. 17 on Reply Card for more Details

SECURE CORD FASTENERS: The Lok-Tite plug and wall plate unit, made by Lok-Tite Mfg. Co., Denver, Colo., is constructed to maintain tight connections for all electrical outlets in shops and plants. Plug of hard rubber, is attached inside a metal holder. Projecting ears on the holder engage under receiver prongs on wall plate.

Check No. 18 on Reply Card for more Details

ROTARY VALVE PUMP: A nutating plate for reciprocating the pistons without any side thrust is incorporated in the Dudly rotary valve pump, produced by Cannon & Co., Los Angeles 21, Calif. The driveshaft is the only revolving unit. Operation may be in either direction with one adjustment. Sizes commonly used in hydraulic systems are manufactured.

Check No. 19 on Reply Card for more Details

CARBIDE-TIPPED TOOL: Turning and single chamfering operations may be performed by the new four cutting edge circular carbide tipped cutting tool designed by R. F. Cook Mfg. Co., Cuyahoga Falls 26, O. Tool may be used through all four cutting positions before resharpening. It may be used on any type of automatic.

Check No. 20 on Reply Card for more Details

MAGNETIC GAS VALVE: Formation of foreign matter in the solenoid which restricts plunger operation is impossible in the K-3H hermetically sealed magnetic valve announced by General Controls Co., Glendale 1, Calif. Valve opens and closes gas fuel supply lines in response to thermostats, limit controls, etc. Sizes from ⅜ to 1¼-inches are offered.

Check No. 21 on Reply Card for more Details

FLUX CORE SOLDER: Divco acid core solder, made by Division Lead Co., Chicago 22, Ill., contains a heavy, cream-like flux that remains nonfluid and will not run out at normal temperatures. When heat is applied, it flows freely and spreads and penetrates quickly. It works well on all solderable metals, including stainless steel, Inconel, nickel, etc.

Check No. 22 on Reply Card for more Details

PORTABLE DRILL: Model 250 light weight, ¼-inch high power portable electric drill, announced by Portable Electric Tools Inc., Chicago 20, Ill., has a comfortable piston grip handle with Cutler-Hammer trigger switch and a Jacobs key type chuck. Redesigned motor is air cooled, operating on 110-115 volts, alternating or direct. Full load and no-load speeds are 600 and 1400 revolutions per minute.

Check No. 23 on Reply Card for more Details

DRILL PRESS VISE: Removable steel jaws and a thread screw for tightening are features of the Palmgren jaw drill press vise made by Chicago Tool & Engineering Co., Chicago 17, Ill. The 3-inch wide jaws open 3 inches and are 1½-inches deep. Side lugs allow bolting to machine tables. It is of semisteel grey iron castings.

Check No. 24 on Reply Card for more Details

PRESSURE CONTROL: Type DD-1 direct acting and DR-1 reverse acting differential pressure control pilots, made by Leslie Co., 152 Delafield Ave., Lyndhurst, N. J., provide constant pressures for process work. Operating medium may be air, clean water, oil or gas. Three pressure ranges are available, with maximum total static pressure being 300 pounds per square inch on all models.

Check No. 25 on Reply Card for more Details

FOR MORE INFORMATION
on the new products and equipment in this section, fill in a card. It will receive prompt attention.

Market Summary

SUPPLY— Outcome of the coal controversy holds the key to steel supply, not only for the immediate future but for next winter as well. Mill inventories of fuel were depleted during the miners' work stoppage two months ago and with steel output at a high rate since then there has been little opportunity to rebuild stocks.

Should the dispute be settled without a miners' strike it is considered possible that production following the Fourth of July holiday let-down may rebound to present high levels. At least the raw material situation should be better, as various blast furnaces now down for repairs are about ready to resume operations if no mine strike is called.

However, if a miners' strike occurs it not only would immediately interrupt steel production but would prevent summer stockpiling of coal in readiness for winter. Consequently, it is conceivable a coal strike now would be felt in the early months of 1949.

DELIVERIES—As a result of steel production lost because of the last miners' work stoppage, mills are still behind in deliveries and in various instances are either taking no orders for July shipment or are reducing customer allotments for that month.

Meanwhile, pressure for all leading products continues strong. Consumption of steel may be eased a trifle in July by mass vacations in consumers' plants. However, this easing probably will be little more than nominal, for buyers remain ready to take in as much tonnage as possible regardless of vacations.

OPERATIONS—Steelmaking operations last week held at 96 per cent of capacity, only two points below the peacetime high attained in January. The steel ingot operating rate rose 2 points to 98 per cent in Cincinnati, 1½ points to 90.5 per cent in eastern Pennsylvania, and ½ point to 99 per cent in Buffalo. The only reduction in schedules was a 3-point drop to 94.5 per cent in Wheeling, all other districts operating at unchanged rates.

NEW CAPACITY— Within 30 days another 6000 to 7500 tons of ingot capacity monthly is to be in production when a new company begins operation of a government-owned standby steel plant at Birdsboro, Pa. The company also is negotiating for additional steel producing and finishing facilities. Another government-owned facility, a blast furnace at Chester, Pa., has been sold and will be put into operation. The new owner, a Texas oil group, proposes to exchange pig iron for pipe.

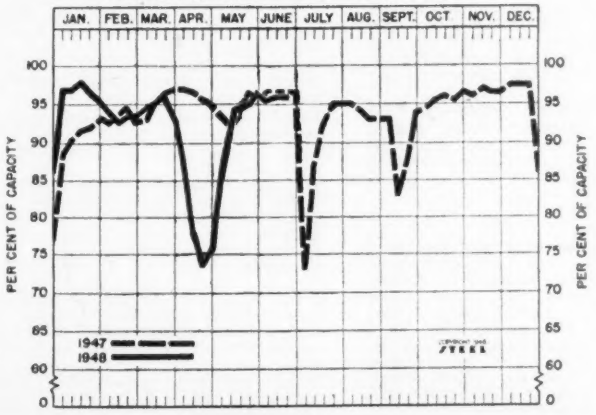
PRICES—Despite inflationary developments since several steel companies reduced prices early in May, another producer has cut floor plate prices $3 a ton. On the other hand, two producers have advanced standard ferromanganese $5 a ton and the Canadian government has authorized increases on a number of steel products and pig iron.

Steel's arithmetical price composites again held unchanged last week and compared with those for the like 1947 week as follows: Finished steel, $80.27 and $69.82; semifinished steel, $68.62 and $52.10; steelmaking pig iron $40.63 and $32.49; steelmaking scrap, $40.67 and $33.50.

WAREHOUSES— Although the war scare has subsided, defense measures are progressing and their needs are becoming ascertainable. Accordingly, interest in aircraft alloy steels is being shown by warehouses, many of which will have stocks of them in the third quarter.

SCRAP—A strong undertone persists in scrap, particularly in cast grades. This reflects in part the insufficient supply of merchant iron and also the unexpected breakdown of an eastern furnace, necessitating increase in the ratio of scrap in melts. While some cast grades rose $1 a ton in some areas, the major open hearth grades of scrap were generally unchanged.

STEELWORKS OPERATIONS



DISTRICT STEEL RATES

Percentage of Ingot Capacity engaged in Leading Districts

	Week Ended June 19	Change	Same Week 1947	Same Week 1946
Pittsburgh	95.5	None	100	86
Chicago	95.5	None	95.5	85
Eastern Pa.	90.5	+ 1.5	93	86
Youngstown	103	None	93	78
Wheeling	94.5	— 3	89	80.5
Cleveland	95.5	None	92.5	88
Buffalo	99	+ 0.5	88.5	86
Birmingham	100	None	99	95
New England	78	None	92	80
Cincinnati	98	+ 2	85	91
St. Louis	89.5	None	84.5	54.5
Detroit	100	None	88	90
Estimated national rate	96	None	96.5	85

Based on weekly steelmaking capacity of 1,802,476 net tons for 1948; 1,749,928 tons for 1947; 1,762,381 tons for 1946.

COMPOSITE MARKET AVERAGES

Arithmetical Price Composites*

	June 19	June 12	Month Ago May 1948	Year Ago June 1947	5 Years Ago June 1943
Finished Steel	$80.27	$80.27	$80.27	$69.82	$56.73
Semifinished Steel	68.62	68.62	68.62	52.10	36.00
Steelmaking Pig Iron	40.63	40.63	39.66	32.49	23.00
Steelmaking Scrap	40.67	40.67	40.67	32.48	19.17

FINISHED STEEL WEIGHTED COMPOSITE†

May 1948	3.59469c
Apr. 1948	3.62766c
May 1947	3.11584c
May 1943	2.44941c

***STRAIGHT ARITHMETICAL COMPOSITES:** Computed from average industry-wide base prices on Finished Carbon Steel (hot-rolled sheets, cold-rolled sheets, cold-rolled strip, hot-rolled bars, plates, structural shapes, basic wire, standard nails, tin plate, standard and line pipe), on Semifinished Carbon Steel (rerolling billets and slabs, sheet bars, skelp, and wire rods), on Basic Pig Iron (at eight leading basing points), and on Steelworks Scrap (No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania). Steel arithmetical composites, dollars per net ton; pig iron and scrap, gross ton.

†FINISHED STEEL WEIGHTED COMPOSITE: Computed in cents per pound, base prices, weighted by actual monthly shipments of following products, representing 83 per cent of total steel shipments in the latest month for which statistics are available, as reported by American Iron & Steel Institute: Structural shapes; plates, standard rails; hot and cold-finished carbon bars; black butt weld pipe and tubes; black lap weld pipe and tubes; black electric weld pipe and tubes; black seamless pipe and tubes; drawn wire; nails and staples; tin and terne plate; hot-rolled sheets; cold-rolled sheets; galvanized sheets; hot-rolled strip; and cold-rolled strip. May, 1948, figure is preliminary.

COMPARISON OF PRICES

Representative market figures for current week; average for last month, three months and one year ago. Finished material (except tin plate) and wire rods, cents per lb; semifinished (except wire rods) and coke, dollars per net ton; others dollars per gross ton.

Finished Materials

	June 19, 1948	May 1948	Mar. 1948	June 1947
Steel bars, Pittsburgh	2.875c	2.875c	2.90c	2.60c
Steel bars, del. Philadelphia	3.365	3.365	3.356	2.98
Steel bars, Chicago	2.875	2.875	2.90	2.60
Shapes, Pittsburgh	2.775	2.775	2.80	2.50
Shapes, del. Philadelphia	2.98	2.98	2.968	2.64
Shapes, Chicago	2.775	2.775	2.80	2.50
Plates, Pittsburgh	2.925	2.925	2.95	2.65
Plates, del. Philadelphia	3.21	3.21	3.19	2.85
Plates, Chicago	2.925	2.925	2.95	2.65
Sheets, hot-rolled, Pittsburgh	2.775	2.775	2.80	2.50
Sheets, cold-rolled, Pittsburgh	3.50	3.50	3.55	3.20
Sheets, No. 10 galv., Pittsburgh	3.90	3.90	3.95	3.55
Sheets, hot-rolled, Gary	2.775	2.775	2.80	2.50
Sheets, cold-rolled, Gary	3.50	3.50	3.55	3.20
Sheets, No. 10 galv., Gary	3.90	3.90	3.95	3.55
Strip, hot-rolled, Pittsburgh	3.05	3.05	3.05	2.50
Strip, cold-rolled, Pittsburgh	3.775	3.775	3.80	3.20
Bright basic, bess. wire, Pittsburgh	3.725	3.725	3.775	3.425
Wire nails, Pittsburgh	5.125	5.125	5.20	4.125
Tin plate, per base box, Pittsburgh	$6.60	$6.60	$6.70	$5.75

Semifinished

Sheet bars, Pittsburgh, Chicago	$60.00	$60.00	$60.00	$44.64
Slabs, Pittsburgh, Chicago	45.00	45.00	45.00	37.50
Rerolling billets, Pittsburgh	45.00	45.00	45.00	37.50
Wire rod 7/32 to 1/4-inch, Pitts.	3.175c	3.175c	3.175c	2.55c

Pig Iron

	June 19, 1948	May 1948	Mar. 1948	June 1947
Bessemer, del. Pittsburgh (N.&S. sides)	$44.08	$41.038	$40.996	$34.83
Basic, Valley	39.00	39.00	39.00	33.00
Basic, eastern del. Philadelphia	42.17	42.17	42.004	35.52
No. 2 fdry., del. Pgh. (N.&S. sides)	43.58	40.538	40.496	34.33
No. 2 fdry., del. Philadelphia	42.67	42.67	42.504	36.02
No. 2 foundry, Chicago	39.00	39.00	39.00	33.00
No. 2 foundry, Valley	39.50	39.50	39.50	33.50
Southern No. 2, Birmingham	39.38	38.63	37.88	29.88
Southern No. 2, del. Cincinnati	45.09	43.90	41.857	34.75
Malleable, Valley	39.50	39.50	39.50	33.50
Malleable, Chicago	39.50	39.50	39.50	33.50
Charcoal, low phos., fob Lyles, Tenn.	58.00	56.50	55.00	40.50
Ferromanganese, fob cars, Pittsburgh	151.15	151.00	151.00	140.25

Scrap

Heavy melt. steel, No. 1, Pittsburgh	$40.25	$40.25	$40.25	$32.44
Heavy melt. steel, No. 2, E. Pa.	39.00	39.00	39.00	33.38
Heavy melt. steel, No. 1 Chicago	39.25	39.25	38.875	30.75
Heavy melt. steel, No. 1, Valley	40.25	40.25	40.25	34.06
Heavy melt. steel, No. 1, Cleveland	39.75	39.75	39.75	32.38
Heavy melt. steel, No. 1, Buffalo	43.00	43.00	44.00	32.00
Rails for rerolling, Chicago	53.00	51.75	49.625	38.75
No. 1 cast, Chicago	68.50	66.00	66.00	39.50

Coke

Connellsville, beehive furnace	$13.00	$12.94	$12.50	$9.56
Connellsville, beehive foundry	15.125	15.06	14.875	10.75
Chicago, oven foundry, del.	20.75	20.75	19.25	16.10

FINISHED AND SEMIFINISHED IRON, STEEL PRODUCTS

Finished steel quoted in cents per pound and semifinished in dollars per net ton, except as otherwise noted. Prices apply on an individual producer basis to products within the range of sizes, grades, finishes and specifications produced at its plants. Delivered prices do not include the 3 per cent federal tax on freight.

Semifinished Steel

Carbon Steel Ingots: Rerolling quality, standard analysis, open market, $90-$95 per gross ton. Forging quality $46 per net ton, Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Buffalo, Youngstown.

Alloy Steel Ingots: Pittsburgh, $56 per gross ton.

Rerolling Billets, Blooms, Slabs: Pittsburgh, Chicago, Gary, Buffalo, Birmingham, $45 per net ton; Cleveland, $47 per net ton; sales by smaller interests on negotiated basis at $85 per gross ton, or higher.

Forging Quality Billets, Blooms, Slabs: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham, $54 per net ton.

Alloy Billets, Slabs, Blooms: Pittsburgh, Chicago, Buffalo, Bethlehem, Canton, Massillon, $66 per gross ton.

Sheet Bars: Pittsburgh, Chicago, Cleveland, Buffalo, Canton, Youngstown, $60 nom., per net ton; sales in open market $95-$105 per gross ton.

Skelp: Pittsburgh, 2.85-2.90c; Youngstown, 2.90c per lb.

Tube Rounds: Pittsburgh, Chicago, Gary, Cleveland, $69-70 per net ton; some sellers quoting up to $120 per gross ton.

Wire Rods: Pittsburgh, Chicago, Birmingham, 7/32 to 1/4-in., inclusive, $2.80-3.55 per 100 lb. 5/16 to 47/64-in., inclusive, $2.75, Cleveland; Galveston, $2.95; Worcester, $2.90-2.95. San Francisco (base del.), $3.5245.

Bars

Hot-Rolled Carbon Bars (O.H. only) and Bar-Size Shapes under 3-in. (Base 20 tons one size): Pittsburgh, Youngstown, Chicago, Gary, Birmingham, 2.85-2.90c; Cleveland, Buffalo, 2.90c; Detroit, del., 3.11c; eastern Mich., 3.18c New York, del., 3.43c; Phila., del., 3.34-3.39c; San Francisco (base, del.), 3.5845-3.95c; Los Angeles (base, del.), 3.579-3.86c; Seattle, 3.8375-3.85c, base.

Rail Steel Bars: Same basing points as merchant carbon bars. Prices upon application.

Hot-Rolled Alloy Bars (Base 20 tons one size): Pittsburgh, Youngstown, Chicago, Gary, 3.20-3.30c; Canton, Massillon, Buffalo, Bethlehem, 3.30c. (Texas Steel Co. uses Chicago base price as maximum fob Fort Worth, Tex., price on sales outside Texas, Oklahoma.)

Cold-Finished Carbon Bars (Base 40,000 lb): Pittsburgh, Chicago, Gary, Cleveland, Buffalo, 3.45-3.55c; Detroit, del. 3.61c; Toledo, 3.68c.

Cold-Finished Alloy Bars: Pittsburgh, Chicago, Cleveland 4.00-4.10c; Gary, Buffalo, Canton, base 4.10c.

Reinforcing Bars (New Billet): Pittsburgh, 2.70-2.75c; Chicago, Gary, Youngstown, Birmingham, 2.70; Sparrows Point, Buffalo, base 2.75c; San Francisco (base, del.), 3.3345c; Los Angeles (base, del.), 3.329c; Seattle, 3.88c-4.18c base.

Iron Bars: Single refined: Pittsburgh 7.70c (hand puddled), Economy, Pa., 8.65c. Double refined: Pittsburgh 9.75c (hand puddled), Economy, Pa., 10.00c. Staybolt: Pittsburgh 11.25c (hand puddled), Economy, Pa., 10.20c.

Sheets

Hot-Rolled Sheets (18 gage and heavier): Pittsburgh, Chicago, Gary, Birmingham, Youngstown, 2.75-2.80c; Cleveland, Buffalo, Sparrows Point, Ashland, Ky., base, 2.80c; Detroit, del., 3.01c; eastern Mich., del., 3.08c; Philadelphia, del., 3.06c; New York, del., 3.18c; Los Angeles (base, del.), 3.494-3.544c; San Francisco, (base, del.) 3.4995-3.5495c. (Alan Wood Steel Co., Conshohocken, Pa., quotes 4.20c, Sparrows Point equivalent).

Cold-Rolled Sheets: Pittsburgh, Chicago, Gary, 3.45-3.55c; Cleveland, 3.50-3.55c; Middletown, 3.50c; Buffalo, Youngstown, Sparrows Point, 3.55c; Granite City, 3.65c; Detroit, del., 3.66-3.76c; eastern Mich., del., 3.73-3.83c; New York, del., 3.93c; Philadelphia, del., 3.81c.

Galvanized Sheets, No. 10: (Based on 5 cent zinc) Pittsburgh, Gary, Birmingham, 3.85-3.95c; Chicago, Sparrows Point, Canton, Middletown, 3.95c; Kokomo, 4.55c; Youngstown, 3.95-4.45c; Granite City, 4.35c; New York, del., 4.33c; Philadelphia, del., 4.21c; Los Angeles (base, del.), 4.624c; San Francisco (base, del.), 4.6295c.

Corrugated Galvanized Sheets, No. 10 (Based on 5-cent zinc): Pittsburgh, Chicago, 3.95-4.05c; Gary, Birmingham, Canton, Youngstown, Middletown, 3.95c.

Culvert Sheets, No. 16 flat (based on 5-cent zinc; corrugated 10 cents extra): Copper alloy: 4.45-4.55c, Pittsburgh, Gary; 4.55c Chicago; 4.90c, Kokomo; 5.00c, Granite City; 5.344c (base del.), Los Angeles; 5.3495c (base del.), San Francisco.

Copper-iron or pure iron: 4.80-4.90c, Pittsburgh; 4.80c, Gary; 4.90c, Chicago, Canton; 5.35c, Granite City.

Aluminized Sheets: Hot-dipped, coils or cut to lengths: Pittsburgh, 7.50c.

Long Ternes, No. 10: Pittsburgh, Chicago, Gary, base, 4.05c.

Enameling Sheets, No. 12: Pittsburgh, 3.85-3.95c; Chicago, Gary, 3.75-3.95c; Cleveland, Middletown, 3.85c; Youngstown 3.95c-4.45c; Granite City, 4.05c; Detroit, del., 4.16c; eastern Mich., 4.23c.

Electrical Sheets, No. 24: Field: Pittsburgh, Chicago, Gary, 4.40-4.50c; Kokomo, Ind., 4.60c. Armature: Pittsburgh, 4.70-5.30c; Chicago, Gary, 4.70-4.80c; Granite City, Ill., 5.25c; Kokomo, Ind., 4.90c. Electrical: Pittsburgh, 5.20-5.80c; Chicago, Gary, 5.20-5.30c; Granite City, Ill., 5.75c; Kokomo, Ind., 5.40c Motor: Pittsburgh, 5.95-6.80c; Chicago, Gary, 5.95-6.05c; Granite City, 6.50c. Dynamo: Pittsburgh, 6.65-7.00c; Granite City, 7.20c. Transformer 72, 7.15-8.25c; 65, 7.85-9.20c; 58, 8.55-9.90c; 52, 9.35-9.45c, Pittsburgh.

Strip

Hot-Rolled Strip: Pittsburgh, 2.80c-3.30c; Chicago, Gary, Birmingham, Youngstown, Cleveland, 2.75-2.80c; Detroit, del., 3.01c; eastern Mich., del., 3.08c; San Francisco (base, del.), 3.5595c; Los Angeles (base, del.), 3.554c.

Cold-Rolled Strip: 0.25 carbon and less: Pittsburgh, 3.50-4.05c; Cleveland, 3.45-3.85c; Youngstown, 3.55-3.85c; Chicago, Gary, 3.55-3.65c; Detroit, del. 3.66-3.76c; eastern Mich., 3.73-3.83c; Worcester, base, 3.65c.

Cold-Finished Spring Steel: Cleveland base: 0.26-0.40 carbon, 3.55c; over 0.40 to 0.60 carbon, 4.95-5.05c; over 0.60 to 0.80, 5.55-5.65c; over 0.80 to 1.05, 7.05-7.15c; over 1.05 to 1.35, 9.35-9.45c; add 0.20c for Worcester.

Tin, Terne Plate

Tin Plate: Pittsburgh, Chicago, Gary, per base box of 100 lb, 1.25 lb coating $6.50, 1.50 lb coating $6.70; Sparrows Point, Birmingham and Warren, O., $6.60 and $6.80, respectively; Granite City, $6.70 and $6.90, respectively.

Electrolytic Tin Plate: Pittsburgh, Gary, per base box of 100 lb, 0.25 lb tin, $5.70; 0.50 lb tin, $5.90; 0.75 lb tin $6.10; Sparrows Point, Birmingham and Warren, O., $5.80, $6.00, $6.20, respectively; Granite City, $5.90, $6.10, $6.30, respectively.

Can Making Black Plate: Pittsburgh, Gary, per base box of 100 lb, 55 to 70 lb basis weight, $5.10; 75 to 95 lb basis weight, $5.00; 100 to 128 lb basis weight, $5.10. Birmingham and Warren, O., $5.20, $5.10, $5.20, respectively.

Holloware Enameling Black Plate: Pittsburgh, Chicago, Gary, base 29-gage, 4.65c per lb; Sparrows Point, Warren, O., 4.75c; Granite City, 4.85c.

Manufacturing Ternes (Special Coated): Pittsburgh, Chicago, Gary, per base box of 100 lb, $5.80; Granite City, Birmingham, Sparrows Point, $5.90; Granite City, $6.

Roofing Ternes: Pittsburgh, per package 112 sheets; 20 x 28 in., coating I.C. 8-lb $15.30.

Plates

Carbon Steel Plates: Pittsburgh, Chicago, Gary, Birmingham, Youngstown, 2.90-2.95c; Cleveland, Sparrows Point, 2.95c; Coatesville, 3.45c; Claymont, 3.65c; Geneva, Utah, 2.90c; Det., del., 3.21c; New York, del., 3.33c; Phila., del., 3.21c; Boston, del., 3.51c; St. Louis, del., 3.269c; San Francisco and Los Angeles, del., 3.493c for sizes and grades produced at Geneva; 3.76c for sizes and grades produced at Fontana, Calif.
(Central Iron & Steel Co., Harrisburg, Pa., 5.10c, basing points.)

Floor Plates: Pittsburgh, 4.05c; Chicago, 3.95-4.05c; Gary, 3.95c; Cleveland, 4.20c.

Open-Hearth Alloy Plates: Pittsburgh, Chicago, Gary, 3.70c; Coatesville, 4.80c.

Clad Steel Plates: Coatesville, 10% cladding: Nickel clad, 21.50c; inconel-clad, 30.00c; monel-clad, 24.00c.

Shapes

Structural Shapes: Pittsburgh, Chicago, Gary, Birmingham, 2.75-2.80c; Buffalo, Bethlehem, 2.80c; New York, del., 3.06c; Phila., del., 2.98c; Geneva, Utah, 2.75c; Los Angeles (base, del.), 3.424-3.474c for sizes produced at Torrance, Calif.; Los Angeles and San Francisco, del., 3.343c for sizes produced at Geneva, 3.81c for sizes produced by Bethlehem in East; San Francisco, del., 3.54c for sizes produced at Fontana, Calif.

Beams, Wide Flange: Pittsburgh, Chicago, 2.70c.

Alloy Structural Shapes: Pittsburgh, Chicago, Gary, 3.45-3.55c.

Steel Piling: Pittsburgh, Chicago, Buffalo, $3.30 per 100 lb.

Wire and Wire Products

(Fob Pittsburgh, Chicago, Cleveland and Birmingham per 100 pounds.)

Wire to Manufacturers in carloads

Bright, basic or bessemer..... *$3.45-4.00
Basic MB Spring (except Birm.)..**$4.85-4.95
Upholstery Spring (except Birm.) †$4.50-4.60

Wire Products to Trade in carloads

Wire, Merchant Quality
Annealed (6 to 8 base).....††$4.10-4.20
Galvanized (6 to 8 base).....††$4.55-4.65
(Fob Pittsburgh, Chicago, Duluth, Birmingham, per base column).

Nails

Standard, cement-coated, galvanized.. ‡91-94
Staples, polished and galvanized..... ‡‡91-94
Woven fence, 15½ gage and heavier. §97-100
Barbed wire, 80-rod spool .....§§111-113
Fence Posts (with clamps)..... ★107
Bale ties, single loop .....★★94-100

* Worcester, $3.55; Duluth, $3.50; San Francisco (base, del.) $4.4645 bright basic only.

** Worcester, $4.95; Duluth & Trenton, N.J., $5.10 (bright only); San Francisco (base del.) $5.8845.

† Worcester $4.60; Duluth and Trenton, N. J., New Haven, Conn., $4.75; San Francisco (base, del.), $5.5345 black upholstery.

†† One producer quotes 25 cents higher at Birmingham and Chicago; Worcester $4.20 annealed, $4.65 galvanized; Cleveland, annealed $4.10, galvanized $4.55; Duluth $4.10 annealed, $4.55 galvanized; Kokomo, Ind., $4.80 annealed, $5.25 galvanized; San Francisco (base, del.) $5.1145 annealed, $5.5645 galvanized.

‡ Cols. 108 and 114 also quoted Pittsburgh; Worcester, Cleveland 97; Duluth, 91; San Francisco (base, del.) 112.

‡‡ Cols. 108 and 114 also quoted Pittsburgh; Worcester 97; San Francisco (base del.) 112.

§ Col. 101 also quoted at Pittsburgh; San Francisco (base del.) 120.

§§ San Francisco (base del.) 131.

★ Duluth, 104.

★★ San Francisco (base del.) 118; Chicago, Birmingham, 94-99.

Rails, Supplies

Rails: Standard, over 60-lb fob mill, $2.70-$2.75 per 100 lb. Light rails (billet), Pittsburgh, Birmingham, $3.05 per 100 lb; light rails (rail-steel), prices upon application. Relaying, 60 lb and over fob warehouse $60-$65 per net ton.

Supplies: Track bolts, 7.00c; heat treated, 7.25c. Tie plates $3.55-$3.65 per 100 lb, fob mill; $3.40 base. Seattle; $3.70 fob Pittsburg, Calif. Splice bars $3.75-$3.85 per 100 lb fob mill. Standard spikes, 4.85c; screw spikes, 6.75c. Axles 4.45-4.50c.

Tubular Goods

Standard Steel Pipe: Base price in carlots, threaded and coupled, to consumers about $200 a net ton. Base discounts Pittsburgh on all types; Lorain on steel butt weld, and seamless; Gary, Ind., 2 points less on steel lap weld and 1 to 2 points less on steel butt weld on sizes produced in that district.

	Butt Weld				
In.	Blk.	Gal.	In.	Blk.	Gal.
⅛	44½	17	1	52½–53½	36½–37½
¼	44½	21½	1¼	53–54	37–38
⅜	41	17	1½	53½–54½	37½–38½
½	47–48	29½–30½	2	54–55	38–39
¾	50–51	33½–34½	2½, 3..	54½–55½	38½–39½

	Lap Weld		Elec. Weld		Seamless	
In.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
2	44½	28	44	27½	43½	27
2½ & 3	48½	32	47	30½	46½	30
3½-6	50½	34	49	32½	48½	32

Line Steel Pipe: Base price in carlots to consumers about $200 a net ton. Base discounts Pittsburgh and Lorain, O.

In.	Butt Weld	In.	Butt Weld
⅛	43½	1	51½-52½
¼	43½	1¼	52-53
⅜	40	1½	52½-53½
½	46–47	2	53-54
¾	49–50	2½ & 3	53½-54½

In.	Lap Weld	Elec. Weld	Seamless
2	43½	43	42½
2½ & 3	46½	46	45½
3½-6	48½	48	47½
8	50½	50	49½
10	50	49½	49
12	49	48½	48

Standard Wrought Iron Pipe: Base price in carlots, threaded and coupled, to consumers about $200 a net ton. Base discounts Pittsburgh.

	Butt Weld			Lap Weld	
In.	Blk.	Gal.	In.	Blk.	Gal.
⅜	+46½	+74½	1¼	+12	+34½
½	+11	+35	1½	+ 6	+27½
¾	+ 1½	+25	2	— 1½	+20
1 and 1¼	— 4	+16½	2½-3½	— 4	+16
1½	— 9½	+13	4	— 8	+10½
2	—10	+12½	4½-8	— 6	+12
			9-12	+ 3	+21½

Boiler Tubes: Net base prices per 100 ft. fob Pittsburgh, in carload lots, minimum wall thickness, cut lengths 4 to 24 feet, inclusive.

		——Seamless——		—Elec. Weld—	
O.D. Sizes	B.W.G.	Hot Rolled	Cold Drawn	Hot Rolled	Cold Drawn
1"	13	....	$12.21	$11.51	$11.51
1¼"	13	....	14.46	11.48	13.64
1½"	13	$13.72	16.14	12.69	15.22
1¾"	13	15.60	18.37	14.43	17.31
2"	13	17.48	20.57	16.17	19.39
2¼"	13	19.48	22.93	18.02	21.62
2¼"	12	21.46	25.25	19.86	23.80
2½"	12	23.51	27.65	21.75	26.06
2¾"	12	24.91	29.30	23.05	27.63
3"	12	26.15	30.77	24.18	29.00
3¼"	11	30.44	35.82	28.16	33.77
3½"	11	32.68	38.47	30.23	36.27
4"	10	40.57	47.73	37.53	44.99
4½"	9	53.77	63.29	....	....
5"	9	62.25	73.25	....	....
6"	7	95.56	112.44	....	....

Pipe Cast Iron: Class B, 6-in. and over $79.50 per net ton, Birmingham; $84.50, Burlington, N. J.; $91.12, del. Chicago; 4-in. pipe, $5 higher; class A pipe, $5 a ton over Class B.

Bolts, Nuts

Fob Pittsburgh, Cleveland, Birmingham, Chicago; add 19c per cwt in carlots, Lebanon, Pa. Additional discounts: 5 for carloads; 15 for full containers, except tire, step, plow bolts.

Carriage and Machine Bolts

½-in. and smaller; up to 6 in. in length	45 off
⅝ and ⅝ x 6-in. and shorter.....	46 off
¾-in. and larger x 6-in. and shorter.	43 off
All diameters longer than 6-in.....	41 off
Tire bolts	35 off
Step bolts	43 off
Plows bolts	54 off
Lag bolts, 6 in. and shorter.....	46 off
Lag bolts, longer than 6 in.	44 off

Stove Bolts

In packages, nuts separate, 65-10 off; bulk 75 off on 15,000 of 3-in. and shorter, or 5000 over 3 in., nuts separate.

Nuts

Semifinished hexagon	A.S. Light	A.S. Reg. and Heavy
⅞-in. and smaller.....	46 off	.....
½-in. and smaller.....	.....	44 off
½-in.-1-in.	44 off	.....
⅝-in.-1-in.	.....	43 off
1⅛-in.-1½-in.	42 off	41 off
1⅝-in. and larger	.....	35 off

Additional discount of 15 for full containers.

Hexagon Cap Screws (Packaged)

Upset 1-in. smaller by 6-in. and shorter (1020 bright).....	53 off
Upset (1035 heat treated)	
⅝ and smaller x 6 and shorter....	48 off
¾, ⅞, & 1 x 6 and shorter.....	44 off

Square Head Set Screws

Upset 1-in. and smaller.....	57 off
Headless, ¼-in. and larger.....	40 off
No. 10 and smaller	52 off

Rivets

Fob Pitts., Cleve., Chicago, Birmingham
Structural ½-in. and larger..... 5.65c
Fob Lebanon, Pa.
Structural ½-in. and larger..... 5.65c*
⅞-in. and larger..... 55 off*

* Plus 19c per cwt in cl.; 26c in lcl.

Washers, Wrought

Fob Pitts., Chicago, Philadelphia, to jobbers and large nut and bolt mfrs.....$1-$2 off

Tool Steels

Tool Steels: Pittsburgh, Bethlehem, Syracuse, Canton, O., Dunkirk, N. Y., base, cents per lb; reg. carbon 16.00-17.00c; extra carbon 20.00c; special carbon 24.00c; oil-hardening 26.00c; high carbon-chromium 47.00c.

W	Cr	V	Mo	Base Per lb
18.00	4	1	...	82.00c
1.5	4	1	8.5	59.00c
12	3	0.50	...	67.00c
6.40	4.15	1.90	5	63.00c
5.50	4.50	4	4.50	80.00c

Stainless Steels

Base, cents per lb, Pittsburgh, Chicago, Cleveland, Bethlehem, Canton, Massillon, Middletown, Watervilet, Dunkirk, Syracuse, Reading, Ft. Wayne, Titusville, Brackenridge, Jersey City, W. Leechburg, Baltimore and Washington, Pa.

Grade	Bars, Wire, Shapes	Plate	Sheets	Hot Rolled Strip	Cold Rolled Strip
	CHROMIUM NICKEL STEELS				
301	26.00c	29.50c	37.00c	22.00c	28.00c
302	26.00	29.50	37.00	23.50	30.50
303	28.50	31.50	39.00	29.50	36.00
304	27.50	31.50	39.00	25.50	32.50
308	31.50	37.00	44.50	31.00	38.00
309	39.00	43.50*	51.00*	40.50	51.00
310	53.50	56.50†	57.50‡	53.00	61.00
316	43.50	48.00	52.00	43.50	52.00
321	31.50	37.00	44.50	32.00	41.50
347	36.00	41.50	49.00	36.00	45.50
431	21.00	24.00	31.50	19.00	24.50
440A	26.00	31.00	36.50	26.00	30.50
	STRAIGHT CHROMIUM STEEL				
410	20.50	23.50	29.00	18.50	24.00
416	21.00	24.00	29.50	20.00	25.50
420	26.00	31.00	36.50	26.00	39.50
430	21.00	24.00	31.50	19.00	24.50
430F	21.50	24.50	32.00	20.50	27.00
442, 443	24.50	28.00	35.50	26.00	35.00
446	30.00	33.00	39.50	38.00	56.50
§501	9.00	13.00	17.50	13.00	18.50
§502	10.00	14.50	18.50	14.50	19.50
	****STAINLESS CLAD STEEL (20%)**				
304	....	24.00	22.00	....	....
410	....	22.00	20.00	....	....
430	....	22.50	20.50	....	....
446	....	29.00	27.00	....	....

One producer quotes: * 6.50c higher, † 3.50c higher, ‡ 10.00c higher. § Low chromium. ** Fob Pittsburgh, Washington and Coatesville, Pa.; plate prices include annealing, pickling.

RAW MATERIAL AND FUEL PRICES

Minimum delivered prices do not include 3 per cent federal tax.

Pig Iron

Per Gross Ton

	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa., base	$40.00	$40.50	$41.00	$41.50
Newark, N. J., del.	42.39	42.89	43.39	43.89
Brooklyn, N. Y., del.	....	44.40	44.90	....
Philadelphia, del.	42.17	42.67	43.17	43.67
Birmingham, base	38.88	39.38	....	....
Cincinnati, del.	....	45.09	....	....
Buffalo, base	40.00†	40.00†	40.50†	41.00
Boston, del.	48.42	48.42	48.92	....
Rochester, del.	42.22	42.22	42.72	43.22
Syracuse, del.	43.025	43.025	43.525	44.025
Chicago, base	38.50	39.00	39.50	40.00
Milwaukee, del.	40.22	40.72	41.22	41.72
Muskegon, Mich., del.	....	43.98	44.48	....
Cleveland, fob furnace	38.50†	39.00†	39.50†	40.00
Akron, del.	40.67	41.17	41.67	42.17
Duluth, base	39.00	39.50	40.00	40.50
Erie, Pa., base	38.50	39.00	39.50	40.00
Everett, Mass., base	....	45.00	45.50	....
Granite City, Ill., base	45.25	45.75	46.25	....
St. Louis, del.	46.00	46.50	47.00	....
‡**Neville Island, Pa.,** base	42.00	42.50	42.50	43.00
Pittsburgh, del., N.&S. Sides	43.08	43.58	43.58	44.08
Provo, Utah, base	39.00	39.50	....	....
Seattle, Tacoma, Wash., del.	....	46.63	....	....
Portland, Oreg., del.	....	46.63	....	....
Los Angeles, San Francisco.	46.13	46.63	....	....
Sharpsville, Pa., base	39.00	39.50	39.50	40.00
Steelton, Pa., base	40.00	40.50	41.00	41.50
Struthers, O., base	42.50	....	....	....
Swedeland, Pa., base	45.00	45.50	46.00	46.50
Toledo, O., base	38.50	39.00	39.50	40.00
Cincinnati, del.	43.05	43.55	....	....
Youngstown, O., base	39.00	39.50	39.50	40.00
Mansfield, O.	42.87	43.37	43.37	43.87

† Republic Steel Corp. quotes $2.875 higher for No. 2 foundry and malleable and $2.375 higher for basic at Buffalo, and $1.25 higher at Cleveland, effective on shipments during week ended June 20.

‡ To Neville Island base add: $0.86 for McKees Rocks, Pa.; $1.31 Lawrenceville, Homestead, McKeesport, Monaco; $1.73 Verona; $1.94 Brackenridge; $1.08 to Ambridge and Aliquippa.

Blast Furnace Silvery Pig Iron

6.00-6.50 per cent Si (base)	$53.50		
6.51-7.00	$54.75	9.01- 9.50	61.00
7.01-7.50	56.00	9.51-10.00	62.25
7.51-8.00	57.25	10.01-10.50	63.50
8.01-8.50	58.50	10.51-11.00	64.75
8.51-9.00	59.75	11.01-11.50	66.00

Fob Jackson, O., per gross ton. Buffalo base $1.25 higher. Buyer may use whichever base is more favorable.

Bessemer Ferrosilicon

Prices same as for blast furnace silvery iron, plus $1 per gross ton.

Electric Furnace Silvery Pig Iron Si 14.01-14.50%, $78.75, Niagara Falls; $78 open-hearth and $79 foundry grade, Keokuk, Iowa. Add $1 a ton for each additional 0.5% Si to 18%; 50c for each 0.05% Mn over 1%; $1 a ton for 0.045% max. phos.

Charcoal Pig Iron

Semi-cold blast, low phosphorus. Fob furnace, Lyles, Tenn.....$58 (For higher silicon iron a differential over and above the price of base grade is charged as well as for the hard chilling iron, Nos. 5 and 6.)

Gray Forge

Neville Island, Pa. $42.00

Low Phosphorus

Steelton, Pa., Buffalo, Troy, N. Y., $46.00. Philadelphia, $48.81, delivered. Intermediate phosphorus, Central furnace, Cleveland, $42.00.

Differentials

Basing point prices are subject to following differentials:

Silicon: An additional charge of 50 cents a ton for each 0.25 per cent silicon in excess of base grade (1.75% to 2.25%).

Phosphorus: A reduction of 38 cents a ton for phosphorus content of 0.70 per cent and over.

Manganese: An additional charge of 50 cents a ton for each 0.50 per cent, or portion thereof, manganese in excess of 1%.

Nickel: An additional charge for nickel content as follows: Under 0.50%, no extra; 0.50% to 0.74%, inclusive, $2 a ton; for each additional 0.25% nickel, $1 a ton.

Metallurgical Coke

Price per Net Ton

Beehive Ovens

Connellsville, furnace	$12.00-$14.00
Connellsville, foundry	14.00- 16.25
New River, foundry	15.50
Wise county, foundry	14.25
Wise county, furnace	13.50

Oven Foundry Coke

Kearney, N. J., ovens	$20.50
Chicago, outside del.	19.50
Chicago, del.	20.75
Terre Haute, ovens	20.25
Milwaukee, ovens	20.25
New England, del.	21.75
Birmingham, del.	16.71
Indianapolis, ovens	20.10
Cincinnati, del.	20.50
Ironton, O., ovens	18.25
Erie, Pa., del.	21.55
Painesville, O., ovens	20.00
Cleveland, del.	21.55
Buffalo, del.	21.75-22.20
Detroit, del.	20.75
Philadelphia, ovens	19.55
Swedeland, Pa., ovens	19.50
Portsmouth, O., ovens	18.25

Coal Chemicals

Spot, cents per gallon

Pure and 90% benzol	21.00†
Toluol, two degrees	28.00
Industrial xylol	28.00
Solvent naphtha	28.00

Per pound fob works

Phenol (car lots, returnable drums)	13.00
Do., less than carlots	13.75
Do., tank cars	12.00

Eastern plants, per pound

Naphthalene flakes, balls, bbl. to jobbers, "household use"	12.00

Per ton, bulk, fob plants

Sulphate of ammonia	$40.00

† Freight allowed up to 2 cents.

Refractories

Net Prices

Per 1000, fob shipping point

Fire Clay Brick

Super Duty

Pa., Mo., Ky.	$92.00

High Heat Duty

Pa., Mo., Ky.	73.00
Ala., Ga.	73.00
N. J.	78.00

Intermediate Heat Duty

Ohio	67.00
Pa., Mo., Ky.	67.00
Ala., Ga.	59.00
N. J.	70.00

Low-Heat Duty

Pa., Md., Ohio	59.00

Ladle Brick

(Pa., O., Va., Mo.)

Dry Press	50.00
Wire Cut	48.00

Malleable Bung Brick

All bases	83.00

Silica Brick

Pennsylvania	73.00
Joliet, E. Chicago	82.00
Birmingham, Ala.	73.00

Basic Brick

Net tons, fob Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick	64.00
Chem. bonded chrome	64.00
Magnesite brick	86.00
Chem. bonded magnesite	75.00

Magnesite

Domestic dead-burned grains, net ton, fob Chewelah, Wash.

Bulk	27.00
Single bags	31.50

Dolomite

Domestic, dead-burned, bulk, net tons, fob Billmeyer, Blue Bell or Williams, Pa., Millville, W. Va., Nario, Millersville, Martin, Gibsonburg or Woodville, O., $11.85; Midwest (fob Thornton or McCook, Ill.), add $0.10; Missouri Valley (fob Dolly Siding, and Bonne Terre Mo.), add $0.20.

Ores

Lake Superior Iron Ore

Gross ton, 51½% (natural) Lower Lake Ports

(Any increase or decrease in R. R. freight rates, dock handling charges and taxes thereon effective after Apr. 1, 1948, are for buyer's account.)

Old range bessemer	$6.60
Old range nonbessemer	6.45
Mesabi bessemer	6.35
Mesabi nonbessemer	6.20
High phosphorus	6.20

Eastern Local Ore

Cents, units, del. E. Pa.

Foundry and basic 56.62% contract	15.25

Foreign Ore

Cents per unit, cif Atlantic ports

No. African low phos.	Nom.
Swedish basic, 60 to 68%	13.50-14.00
Spanish, No. African basic, 50 to 60%	Nom.
Brazil iron ore, 68-69% fob Rio de Janeiro, nom.	5.50-6.50

Tungsten Ore

Wolframite and scheelite per short ton unit, duty paid	$26–$28

Manganese Ore

48-50%, duty paid, fob cars, New York, Philadelphia, Baltimore, Norfolk, Va., Mobile, Ala., New Orleans, 67.60c-72.60c.

Chrome Ore

Gross ton fob cars, New York, Philadelphia, Baltimore, Charleston, S.C., plus ocean freight differential for delivery to Portland, Oreg., and/or Tacoma, Wash. (S S paying for discharge; dry basis, subject to penalties if guarantees are not met.)

Indian and African	
48% 2.8:1	$37.50
48% 3:1	39.00
48% no ratio	31.00
South African (Transvaal)	
44% no ratio	$25.50-$26.00
45% no ratio	26.50
48% no ratio	29.00-30.00
50% no ratio	29.50-30.50
Brazilian—nominal	
44% to 2.5:1 lump	$33.65
Rhodesian	
45% no ratio	$27-$27.50
48% no ratio	30.00
48% 3:1 lump	39.00
Domestic (seller's nearest rail)	
48% 3:1	$39.00

Molybdenum

Sulphide conc., lb., Mo., cont., Mines	$0.75

Fluorspar

Metallurgical grade, fob shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content, 70% or more, $35; less than 60% $32.

HIGH STRENGTH—LOW-ALLOY STEELS

Prices in dollars per 100 pounds

	Pittsburgh	Chicago	Gary	Youngstown	Sparrows Point	Buffalo	Cleveland	Bethlehem	Canton Massillon
Sheet, Hot-Rolled	4.20	4.20–4.30	4.20–4.30	4.20–4.30	4.30	4.30	4.20	...	...
Cold-Rolled	5.20	5.20–5.30	5.20–5.30	5.20–5.30	...	5.30	5.20	...	...
Galvanized	5.90	.....	.....	.....	...	6.00	...	...	...
Strip, Hot-Rolled	4.20	4.30	4.20–4.30	4.20–4.30	...	...	4.20	...	...
Cold-Rolled	5.20	5.30†	5.30†	5.30	...	...	5.20	...	...
Shapes, Structural	4.20	4.20–4.30	4.20	4.30	...	...	...	4.30	...
Plates	4.45	4.45–4.55	4.45–4.55	.....	4.55	...	...	...	...
Bars, Small Shapes	4.35	4.35–4.45	4.35–4.45	4.35–4.45	...	4.45	...	...	4.45

† Nax High Tensile, produced by Great Lakes Steel Corp., quoted 10 cents higher.

WAREHOUSE STEEL PRICES

Prices, cents per pound, for delivery within switching limits, subject to extras.

	SHEETS			STRIP		BARS				PLATES	
	H-R 10 Ga.	C-R 17 Ga.	Gal. *10 Ga.	†H-R	†C-R	H-R Rds. ⅜" to 3"	C-F Rds. ½" & up	H-R Alloy **4140	Structural Shapes§§	Carbon ⅜"-¾"	Floor ¾" & Thicker
Boston (city) ..	5.08	5.84[4]	6.28[4]	5.64	6.90	5.09	5.96	7.70	4.94	5.23	6.89
Boston (c'try)..	4.98	5.64[4]	6.08[4]	5.44	...	4.89	...	...	4.74	5.03	6.69
New York (city)	4.94	5.80	6.13	5.58	...	5.05	5.78	7.23	4.77	5.09	6.58
New York (c'try)	4.79	5.65	5.98	5.43	...	4.90	...	...	4.62	4.94	6.43
Phila. (city) ..	4.67	5.81	5.90	5.16	5.72	4.87	5.75	8.65	4.57	4.85	6.36
Phila. (c'try.) .	4.52	5.66	5.75	4.81	5.57	4.73	...	...	4.47	4.71	6.21
Wash. (city) ..	4.81	...	...	5.08	...	5.14	5.79	...	4.98	5.03	6.68
Wash. (c'try.) .	4.71	...	...	4.98	...	5.04	...	...	4.88	4.93	6.58
Balt. (city) ...	4.27†	5.59	5.62	4.79	...	4.84	5.66	...	4.69	4.72	6.09
Balt. (c'try.) .	4.12†	5.44	5.40	4.64	...	4.69	...	...	4.54	4.57	5.94
Norfolk, Va. ..	4.90	...	...	...	...	5.20	6.00	...	5.15	5.15	6.90
Memphis (city)	4.91[20]§	5.98[8]†	...	5.11[20]	...	5.01[20]	5.88	...	5.01[20]	5.21[20]	6.83[20]
Memphis (c'try)	4.81[20]§	5.88[8]†	...	5.01[20]	...	4.91[20]	5.78	...	4.91[20]	5.11[20]	6.73[20]
Buffalo (city) .	4.25	5.20[8]	6.05	5.25	5.97	4.40	5.10	6.85	4.40	5.00	6.25
Buffalo (c'try.)	4.10	5.05[8]	5.50	4.70	5.82	4.25	4.95	6.85	4.25	4.45	5.75
Pitts. (city) ..	4.20-4.25§	5.05-5.10[8]†	5.60-5.65	4.30-4.35	5.35	4.35-4.40	5.05-5.10	6.85	4.35-4.40	4.55	5.80-5.90
Pitts. (c'try) ..	4.05-4.10§	4.85-4.95[8]†	5.40-5.50	4.15-4.20	5.20	4.20-4.25	4.85-4.95	6.85	4.20-4.25	4.40	5.65-5.75
Cleve. (city) ..	4.40-4.90	5.10-5.75[8]	5.74-6.45	4.52	5.25	4.35-4.40	5.00-5.10	7.14	4.67	4.55-4.60	5.80-5.90
Cleve. (c'try.) .	4.25-4.90	4.95-5.75[8]	...	...	5.10	4.20-4.25	4.85-4.95	...	...	4.40-4.45	5.65-5.75
Cincinnati	4.51-4.66	5.22	5.77	4.80	6.00	4.76	5.59	...	4.80	4.96	6.21
Indianapolis ...	4.52	5.01[8]	5.96	4.62	5.87	4.67	5.52	8.85	4.67	4.87	6.17
Chicago (city) .	4.40	5.10[8]	5.55-5.65	4.30	5.35	4.35	5.00	6.70[9]	4.35	4.55	5.80
Chicago (c'try.)	4.25	4.95[8]	5.40-5.50	4.15	5.20	4.20	4.85	6.70[9]	4.20	4.40	5.65
Milwaukee	4.62	5.32[8]	5.77-5.87	4.52-5.02	5.57	4.57	5.334	7.184[9]	4.57	4.77	6.02
St. Paul, Minn..	4.66[6]	5.56[8]†	6.01[8]	4.76	6.29[12]	4.81[6]	5.94[11]	7.84[11]	4.81[6]	5.01[6]	6.26[6]
St. Louis	4.79	5.49[8]	6.27	5.24	5.97	4.74	5.62[12]	8.97	4.74	4.94	6.19
Birming. (city).	4.45[20]§	...	5.65	4.45[20]	...	4.40[20]	6.09[22]	...	4.40	4.65	6.99
Birming. (c'try.)	4.30[20]§	...	5.50	4.30[20]	...	4.25[20]	...	...	4.25	4.50	...
Houston, Tex. .	5.75	...	7.36	6.00	...	5.70	7.00	9.25[9]	5.70	5.90	7.20
Omaha, Nebr...	5.31	...	6.76	5.41	...	5.46	6.96	...	5.41	5.66	5.65
Los Angeles ...	5.70§	7.25[8]	7.30	6.00	8.60	5.45	7.25[1]	9.40[2]‡‡	5.15-5.30	5.35	7.40
Seattle-Tacoma.	5.45[17]§	7.25[8]‡	7.10	6.15[17]	...	5.65[17]	7.35[1]	8.70[12]	5.30[17]	5.60[17]	7.65[17]

Base Quantities: 400 to 1999 lb except as noted: Cold-rolled strip, 2000 lb and over; cold finished bars, 1000 lb and over; galvanized sheets, 450 to 1499 lb; [1]—1500 lb and over; [2]—1000 to 4999 lb; [3]—450 to 39,999 lb; [4]—three to 24 bundles; [5]—450 to 1499 lb; [6]—400 to 14,999 lb; [8]—400 to 1499 lb; [9]—1000 to 1999 lb; [11]—1000 to 39,999 lb; [12]—1000 lb and over; [15]—2000 lb and over; [17]—300 to 9999 lb; [18]—1500 to 1999 lb; [19]—1500 to 39,999 lb; [20]—400 to 3999 lb; [21]—400 lb and over; [22]—500 to 1499 lb.

* Includes gage and coating extra, except Birmingham (coating extra excluded); † does not include gage extras; ‡ 15 gage; § 18 gage and heavier; ** as rolled; †† add 0.40 for sizes not rolled in Birmingham; ‡‡ annealed; §§ except wide flange beams, which are 0.05c lower.

PRICES OF LEADING FERROALLOYS PRODUCTS

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si) Carlot per gross ton, $52, Palmerton, Pa., $51, Pittsburgh; (16% to 19% Mn.) $1 per ton lower.

Standard Ferromanganese: (Mn 78-82%, C 7% approx.). Carload, lump, bulk $145 per gross ton of alloy, carload packed $157, ton lot $172, less ton $189, fob New Orleans, Mobile, Philadelphia, Baltimore, New York. Carload, lump, bulk, $150 fob Rockwood, Tenn.; $150.50 fob Aetna, Pa., or $151.15 within Pittsburgh switching limits. Add or subtract $1.80 for each 1%, or fraction thereof, of contained manganese over 82% or under 78%. West Coast Prices: Carload (80,000 lb or more), lump, bulk, same price and basing points as above. All other prices for shipment from Pacific Coast warehouses, add $26.21 to above prices. Delivery is fob Portland, Los Angeles, South San Francisco, or Seattle warehouses, with railroad freight allowed on shipments of 25 gross tons or more.

Low-Carbon Ferromanganese, Regular Grade: (Mn 80-85%). Eastern Zone, carload, lump, bulk, max. 0.10% C, 22.5c per lb of contained Mn, carload packed 23.25c, ton lot 24.35c, less ton 25.55c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.7c for c.l. and 4.4c for l.c.l. Freight allowed. Deduct 0.5c for max. 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5c for max. 0.50% C, and 4.5c for max. 0.75% C—max. 7% Si. **Special Grade:** (Mn 90% approx., C 0.07% max., P 0.06% max.). Add 0.5c to above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max., Si 1.5% max.). Eastern Zone, carload, lump, bulk 16.5c per lb of contained Mn, carload packed 17.25c, ton lot 18.35c, less ton 19.55c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.7c for c.l. and 4.4c for l.c.l. Freight allowed. Spot, add 0.25c.

Manganese Metal: (Mn 96% min., Fe 2% max., Si 1% max., C 0.20% max.). Eastern Zone, carload, 2" x D, bulk 32c per lb of metal, carload packed 32.5c, ton lot 34c, less ton 36c; Central, add 1c for c.l. and 1.45c for l.c.l.; Western, add 1.45c for c.l. and 2.4c for l.c.l. Freight allowed. Spot, add 2c.

Silicomanganese: (Mn 65-70%). Eastern Zone, contract, lump, bulk, 1.50% C grade, 17-20% Si, 7.8c per lb of alloy, carload packed, 8.55c, ton lot 9.45c, less ton 10.45; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.8c for c.l. and 2.5c for l.c.l. Freight allowed. For 2.0% C grade, Si 15-17%, deduct 0.2c from above prices. Spot, add 0.25c.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Eastern Zone, contract, c.l., lump, bulk 18.6c per lb of contained Cr, c.l., packed 19.5c, ton lot 20.65c, less ton 22.05c; Central, add 0.4c for c.l. and 1.3c for l.c.l.; Western, add 0.55c for c.l. and 2.1c for l.c.l. Freight allowed. Spot, add 0.25c.

"SM" High-Carbon Ferrochrome: (Cr 60-65%, Si 4-6%, Mn 4-6%, C 4-6%). Add 1.1c to high-carbon ferrochrome prices.

Foundry Ferrochrome: (Cr 62-66%, C 5-7%). Eastern Zone, contract, c.l., 8MxD, bulk 20.1c per lb of cotnained Cr, c.l., packed 21.0c, ton lot 22.35c, less ton 24.1c; Central, add 0.4c for c.l. and 1.3c for l.c.l.; Western, add 0.55c for c.l. and 2.1c for l.c.l. Freight allowed. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%). Eastern Zone, contract, carload, lump, bulk, max. 0.03% C 28.5c per lb of contained Cr, 0.04% C 27.5c, 0.05% C 27.0c, 0.06% C 26.5c, 0.10% C 26.0c, 0.15% C 25.5c, 0.20% C 25.25c, 0.50% C 25.0c, 1% C 24.5c, 2% C 24.25c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c; Central, add 0.4c for c.l. and 0.65c for l.c.l.; Western, add 0.5c for c.l. and 1.85c for l.c.l. Freight allowed. Spot, add 0.25c.

"SM" Low-Carbon Ferrochrome: (Cr 62-66%, Si 4-6%, Mn 4-6%, add C 1.25% max.). Eastern Zone, contract, carload, lump, bulk 25c per lb of contained chromium, carload, packed 26.1c, ton lot 27.3c, less ton 29.1c; Central, add 0.4c for c.l. and 0.65c for l.c.l.; Western, add 0.5c for c.l. and 1.85c for l.c.l. Freight allowed. Spot, add 0.25c.

Low-Carbon Ferrochrome, Nitrogen Bearing: Add 2c to 0.10% C low-carbon ferrochrome prices for approx. 0.75% N. Add 2c for each 0.25% of N above 0.75%.

Chromium Metal: (Mn. 97% Cr and 1% Fe). Eastern Zone, contract, carload, 1" x D; packed, max. 0.50% C grade, 93c per lb of contained chromium, ton lot 94.5c, less ton 97c; Central, add 1.5c for c.l. and 2.5c for l.c.l.; Western, add 2.75c for c.l. and 4.5c for l.c.l. Freight allowed. Spot, add 5c.

SILICON ALLOYS

50% Ferrosilicon: Eastern Zone, contract, carload, lump, bulk 9.3c per lb of contained Si, carload packed 10.9c, ton lot 12.35c, less ton 14.0c; Central, add 0.5c for c.l. and 1.25c for l.c.l.; Western, add 0.7c for c.l. and 1.8c for l.c.l. Freight allowed. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (All 0.40% max.) Add 1.3c to 50% ferrosilicon prices.

75% Ferrosilicon: Eastern Zone, contract, carload, lump, bulk 11.8c per lb of contained Si carload packed 13.1c, ton lot 14.25c, less ton 15.5c; Central, add 0.3c for c.l. add 0.75c for l.c.l.; Western, add 1.05c for c.l. and 5c for l.c.l. Freight allowed. Spot, add 0.3c.

85% Ferrosilicon: Eastern Zone, contract, carload, lump, bulk 13.3c per lb of contained Si, carload packed 14.55c, ton lot 15.55c, less ton 16.7c; Central, add 0.3c for c.l. and 0.7c for l.c.l.; Western, add 1.05c for c.l. and 4.4c for l.c.l. Freight allowed. Spot, add 0.25c.

Low-Aluminum 85% Ferrosilicon: (Al 0.50% max.). Add 0.7c to 85% ferrosilicon prices.

90% Ferrosilicon: Eastern Zone, contract, carload, lump, bulk, 15c per lb of contained Si carload packed 16.2c, ton lot 17.15c, less ton 18.2c; Central, add 0.3c for c.l. and 0.65c for l.c.l.; Western, add 1c for c.l. and 4c for l.c.l. Freight allowed. Spot, add 0.25c.

Low-Aluminum 90-95% Ferrosilicon: (Al 0.50% max.). Add 0.7c to above 90-95% ferrosilicon prices.

Silicon Metal: (Over 97% Si and 1% max. Fe.) Eastern Zone, c.l., lump, bulk, regular 17.3c per lb of Si, c.l. packed 18.5c, ton lot 19.4c, less ton 20.4c; Central, add 0.6c for c.l. and 2.25c for l.c.l.; Western, add 1.2c for c.l. and 4c for l.c.l. Add 1c for max. 0.20% calcium grade. Add 1.5c for max. 0.10% calcium grade. Deduct 0.4c for max. 2% Fe grade analyzing over 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe) Contract basis fob Niagara Falls, N. Y., lump per lb cl 6.90c; ton lots packed, 7.40c; 200 to 1999 lb, 8.15c; smaller lots 8.65c. Spot up 0.5c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3⅛ lb each and containing exactly 2 lb of Cr). Eastern Zone, contract, carload, bulk, 12.5c per lb or briquet, carload packed 13.2c, ton lot 14.0c, less ton 14.9c; Central, add 0.25c for c.l. and 0.9c for l.c.l.; Western, add 0.35c for c.l. and 1.5c for l.c.l. Freight allowed. Add 0.25c for notching. Spot, add 0.25c.

(Please turn to Page 172)

Metal Subsidy Bill Tabled

Prospects for passing Russell bill fade as committee fails to report it out. Bill suspending lead duties awaits President's signature

New York — Operators of marginal metal mines will receive no relief from the present Congress. Action on a bill to authorize federal payments of up to $80 million a year to mines which cannot operate at a profit on present metal prices was postponed last week by the House Rules Committee. This action in effect killed the bill for this session of Congress.

A firm price tone was maintained in all major primary metal markets, although platinum continued easy with prices dropping $13 an ounce.

Copper — Domestic stocks of refined copper increased 5534 tons last month to a total of 72,791 tons, according to figures released by the Copper Institute, this city. Deliveries of refined copper to fabricators declined 3086 tons to 113,389 tons and compared with 118,120 tons in May, 1947. Of last month's total, 661 tons were furnished by the Offices of Metals Reserve. Production of refined copper held steady at 104,524 tons compared with 104,044 tons in April and 108,536 tons in May, 1947.

Production of crude copper increased 2485 tons to 91,526 tons and compared with 91,275 tons in the like month a year ago. Of last month's total, 76,492 tons represented primary production; 15,034 tons, secondary production.

Although demand continued heavy last week in both the domestic and export markets, actual bookings were light. Electrolytic was firm at 21.50c, Connecticut Valley, and 21.50c to 22.25c, f.a.s. New York.

Lead—Import duty on lead will be suspended until June 30, 1949, as soon as the President signs bill HR 6489.

Domestic lead consumption averaged 3276 tons per day in March, a 6 per cent increase over the average daily rate of consumption in February, according to the Bureau of Mines. Total lead consumption in the first quarter was 284,139 tons, an average of 94,713 tons a month.

Consumers' stocks of lead increased 8 per cent during March. Their inventories of refined lead gained 3 per cent; antimonial lead, 19 per cent; and percentage metals, 11 per cent. Imports of lead in March declined 11 per cent from the February figure to 23,726 tons, but remained well above the 18,982-ton monthly average imported in 1947.

The average daily rate of lead output from domestic mines in April rose to the highest level in four years. Not since April, 1944, when daily output averaged 1258 tons have United States mines produced lead in excess of the 1177 tons per day average in April, 1948. Production in April advanced to within 23 per cent of the 1534-ton average daily wartime peak output established in February, 1942. April lead production totaled 35,319 tons compared with 35,802 tons in March.

Zinc—Illinois Zinc Co., announced last week that its expansion and modernization program has been completed and that Eraydo alloy is now available for delivery within three to five weeks. This alloy is used widely by the construction industry for gutter, downports, valley flashing, termite shields, corrugated roofing and siding, and many other applications requiring sheet metal. It is also widely used in the radio industry.

Average daily rate of zinc production from domestic mines declined slightly in April to 52,561 tons from 54,545 tons in March, according to the Bureau of Mines. The average daily output was 1752 tons in April, 1760 tons in March, and 1712 in all of 1947.

Tin — Office of Metals Reserve held 32,437 tons of pig tin on May 31 compared with 27,956 tons as of Apr. 30 and 20,542 tons as of Nov. 30, 1947. Smelter output amounted to 3310 tons in May compared with 2906 tons in April while imports jumped to 6299 tons from 3207 tons in April and only 1454 tons in March. Allocations totaled 5055 tons last month against 5010 tons in April and 5175 tons in March.

Platinum — Price of platinum was reduced $13 an ounce last week by a leading refiner to the basis of $75 an ounce for bulk quantities and $78 for retail lots. The former prices had been in effect since June 4 on which day they had been reduced $10. Industry members attributed the decline to continued rather free offerings from speculative holdings and from metal purchased as a hedge against inflation some time ago at lower prices. Demand from the jewelry trade is small and industrial buying has not been heavy.

Remelt Aluminum Ingot Output Rises in February

Washington—Production of secondary aluminum ingots increased 7 per cent in February to a total of 15,978 tons, according to the Bureau of Mines. This increase was apparently accomplished by a drain on scrap inventories, as smelters found it difficult to satisfy their scrap requirements in the rapidly tightening market. Shipments to consumers increased to 17,173 tons from 16,711 tons in January while stocks declined to 12,202 tons as of Feb. 29 from 13,397 tons at the end of January.

Total consumption of aluminum scrap increased 6 per cent to 17,987 tons in February from 16,994 tons in January.

Production of aluminum-copper-silicon (each over 2.5 per cent) alloy continued the rising trend evident since November, and reached the highest point since March, 1947. Output of deoxidizing ingot, after declining in January, increased 11 per cent in February. Production of aluminum-silicon (max. copper, 1 per cent) alloy exhibited a slight decline in February, but the loss was offset by a compensating gain in output of No. 12 alloy.

Metallic Sodium, Cyanide Compound Prices Advance

Wilmington, Del. — Increases in the prices of metallic sodium, cyanide compounds, trichloroethylene, and hydrogen and sodium peroxides were announced last week by the E. I. du Pont de Nemours & Co. The increases, effective July 1, were attributed to the rising cost of raw materials, production and shipping. They are the first increases in base prices of these products, except trichloroethylene, since 1918. The new prices are: Metallic sodium, 16.50c a pound, up 1½-cents; sodium cyanide, 14.00c, up 1 cent, and other cyanide compounds, up proportionately; trichloroethylene, 10.50c, up ½-cent; sodium peroxide 16.00c, up 2 cents; and 35 per cent hydrogen peroxide, 20.50c, up 1 cent.

Permanente Plans To Place Aluminum on Quota Basis

San Francisco—Permanente Metals Corp., which produces about one-fifth of the nation's annual primary aluminum output, plans to begin rationing the light metal to its customers soon. The company intends to reserve about 20 per cent of its output for the emergency aircraft building program. As the company's annual production is about 258 million pounds, this means some 51.6 million pounds produced by the company will be channeled from civilian usage into defense production. Most of the production at Permanente's Spokane, Wash., aluminum plants is being used by the construction industry.

A shortage of electricity, and recent floods which have hampered aluminum plant operations in the Pacific Northwest, puts a brake on expansion of aluminum output.

ECA Authorizes $15 Million For Buying of Metals

Washington—Economic Co-operation Administration has authorized the purchase of more than $15 million worth of metals by countries participating in the European Recovery Program. The following authorizations were announced:

Copper, purchased in Canada by the United Kingdom or its authorized agents, $10,600,000.

Lead, procured in Canada by the United Kingdom or its authorized agents, $1 million.

Zinc, purchased in the United States by the United Kingdom or its authorized agents, $1,700,000.

Aluminum, purchased in Canada by the United Kingdom or its authorized agents, $10,600,000.

Tin plate, to the Netherlands, purchased in the United States through private trade channels, $508,000.

Black iron sheets, to Austria, purchased in the United States by the Bureau of Federal Supply, $15,300.

NONFERROUS METAL PRICES

(Cents per pound, carlots, except as otherwise noted)

Copper: Electrolytic, 21.50c, Conn. Valley; Lake, 21.62½c Conn. Valley.

Brass Ingot: 85-5-5-5 (No. 115) 19.00-19.25c; 88-10-2 (No. 215) 29.00c; 80-10-10 (No. 305) 25.25c; No. 1 yellow (No. 405) 15.25-16.00c. Prices include 25 cents per 100 lb freight allowance.

Zinc: Prime western 12.00c, brass special 12.25c, intermediate 12.50c, East St. Louis; high grade 13.00c, delivered.

Lead: Common 17.30-17.35c; chemical and corroding 17.40c, St. Louis.

Primary Aluminum: 99% plus, ingots 15.00c, pigs 14.00c; metallurgical 94% min. 13.50c. Base prices for 10,000 lb and over, fob shipping point, freight allowed.

Secondary Aluminum: Piston alloy (No. 122 type) 19.75-20.75c; No. 12 foundry alloy (No. 2 grade) 19.50-20.25c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 20.75-21.75c; grade 2 20.25-21.00c; grade 3, 19.75-20.50c; grade 4 19.00-20.00c. Prices include freight at carload rate up to 75 cents per 100 lb.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over, 20.50c, fob Freeport, Tex.

Tin: Grade A, 99.8% or higher (including Straits) $1.03; grade B, 99.8% or higher, not meeting specifications for grade A, with 0.05% max. arsenic, $1.028; grade C, 99.65-99.79%, incl., $1.024; 99.5-99.649% $1.024, grade F, 98-98.999% $1.015 for tin content. Prices are ex-dock, New York, in 5-ton lots.

Antimony: American, 99-99.8% and over but not meeting specifications below, 35.00; 99.8% and over (arsenic 0.05% max.; other impurities, 0.1% max.) 35.50c, fob Laredo, Tex., for bulk shipments.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 33.75c; 25-lb pigs, 35.25c; shot, 36.25c; "F" nickel shot or ingots, for addition to cast iron, 34.25c. Prices include import duty.

Mercury: Open market, spot, New York $76-$78 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $20.50 per lb contained Be.

Cadmium: "Regular" straight or flat forms, $1.75, del.; Special or patented shapes, $1.80.

Cobalt: 97-98%, $1.65 per lb for 550 lb (keg); $1.67 per lb for 100 lb (case); $1.72 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York, 74.62½c per ounce.

Platinum: $75-$78 per ounce.

Palladium: $24 per troy ounce.

Iridium: $110-$120 per troy ounce.

Rolled, Drawn, Extruded Products

COPPER AND BRASS
(Base prices, fob mill.)

Sheet: Copper 33.68c; yellow brass 30.16c; commercial bronze, 95% 33.80c, 90% 33.27c; red brass, 85% 32.23c, 80% 31.70c; best quality 31.09c; Everdur, Duronze, Herculoy or equiv., hot-rolled, 38.56c; nickel silver, 18%, 42.42c; phosphor bronze, grade A, 5%, 52.70c.

Rods: Copper, hot rolled 30.03c, cold drawn 31.03c; yellow brass, free cutting, 24.69c; commercial bronze, 95% 33.49c, 90% 32.96c; red brass, 85% 31.92c, 80% 31.39c.

Seamless Tubing: Copper 33.72c; yellow brass 32.92c; commercial bronze 90% 35.68c; red brass 85% 34.89c, 80% 34.36c.

Wire: Yellow brass 30.45c; commercial bronze, 95% 34.09c, 90% 33.56c; red brass, 85% 32.52c, 80% 31.99c; best quality brass 31.38c.

Copper Wire: Bare, soft, fob eastern mills, c.l. 26.80c, l.c.l. 27.30c; weatherproof, fob eastern mills, c.l. 27.35c, l.c.l. 27.85c; magnet, delivered, c.l. 29.75c-31.13c, 15,000 lb or more 30.00c-31.38c, l.c.l. 30.50c-31.88c.

ALUMINUM
(Base prices, fob shipping point)

Sheets and Circles: 2s and 3s mill finish c.l., fob shipping point.

Thickness Range, Inches	Widths or Diameters, In., Incl.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	24.0	...	...
0.135-0.126	12-48	24.5	...	...
0.125-0.096	12-48	24.5	23.1	26.3
0.095-0.077	12-48	25.0	23.2	26.5
0.076-0.061	12-48	25.5	23.4	26.7
0.060-0.048	12-48	25.7	23.6	27.0
0.047-0.038	12-48	26.1	23.8	27.3
0.037-0.030	12-48	26.4	24.1	27.7
0.029-0.024	12-48	26.8	24.4	28.1
0.023-0.019	12-36	27.4	24.8	28.6
0.018-0.017	12-36	27.9	25.3	29.3
0.016-0.015	12-36	28.6	25.9	30.1
0.014	12-24	29.4	26.6	31.1
0.013-0.012	12-24	30.2	27.3	32.0
0.011	12-24	31.1	28.1	33.1
0.010-0.0095	12-24	32.1	29.0	34.3
0.009-0.0085	12-20	33.2	30.0	35.7
0.008-0.0075	12-20	34.4	31.1	37.1
0.007	12-18	35.7	32.3	38.8
0.006	12-18	37.0	33.5	42.6

* Minimum length, 60 inches. † Maximum diameter, 24 inches.

Screw Machine Stock: Cents per pound, 5000 lb and over.

Diam. (in.) or distance across flats	—Round— R317-T	17S-T	—Hexagonal— R317-T	17S-T
0.125	45.0	44.0	...	...
0.156-0.203	38.5	37.5	...	...
0.219-0.313	35.5	34.5	...	...
0.344	34.0	33.0	...	...
0.375	33.0	32.0	42.5	40.0
0.406	33.0	32.0	...	...
0.438	33.0	32.0	42.5	40.0
0.469	33.0	32.0	...	...
0.500	33.0	32.0	42.5	40.0
0.531	33.0	32.0	...	...
0.563	33.0	32.0	40.5	38.0
0.594	33.0	32.0	...	...
0.625	33.0	32.0	40.5	38.0
0.656	33.0	32.0	...	...
0.688	33.0	32.0	40.5	38.0
0.750-1.000	32.0	31.0	37.0	35.5
1.063	32.0	31.0	35.5	34.0
1.125-1.500	31.0	30.0	35.5	34.0
1.563	31.0	30.0	...	...
1.625	30.0	29.0	34.5	33.0
1.688-2.000	30.0	29.0	...	...
2.125-2.500	29.5	28.5	...	...
2.625-3.375	28.5	27.5	...	...

LEAD
(Prices to jobbers, fob Cleveland, Pittsburgh)

Sheets: Full rolls, 140 sq ft or more, $20.85 per cwt.; add 50c per cwt., 10 sq ft to 140 sq ft; $1.25, less than 10 sq ft; $1, circles and segments. Pipe: Full coils, $20.10 per cwt; cut coils, $20.35. Traps and Bends: List price plus 52%.

ZINC

Sheets, 16.50c-17.00c, fob mill, 36,000 lb and over. Ribbon zinc in coils, 15.25c-16.00c, fob mill, 36,000 lb and over. Plates, not over 12-in., 14.25c; over 12-in., 15.25c.

NICKEL
(Base prices, fob mill.)

Sheets, cold-rolled, 54.00c. Strip, cold-rolled, 60.00c Rods, hot-rolled 50.00c, cold-finished 55.00c. Angles, hot-rolled, 50.00c. Plates, 52.00c. Seamless tubes, 83.00c.

MONEL
(Base prices, fob mill.)

Sheets, cold-rolled 43.00c; No. 35, 41.00c. Strip, cold-rolled, 44.00c. Rods, hot-rolled 39.00c; cold-finished 44.00c. Angles, hot-rolled, 39.00c. Plates, 41.00c. Seamless tubes, 71.00c. Shot and blocks, 31.00c.

MAGNESIUM

Extruded Rounds, 12 in. long, 1.312 in. in diameter, less than 25 lb, 52.00-56.00c; 25 to 99 lb, 42.00-46.00c; 100 lb to 4000 lb. 35.00-36.00c.

Plating Materials

Chromic Acid: 99.9%, flake, fob Philadelphia, carloads, 22.00c; 5 tons and over 22.50c; 1 to 5 tons, 23.00c; less than 1 ton, 23.50c.

Copper Anodes: Base, 2000 to 5000 lb; fob shipping point, freight allowed: Flat untrimmed, 30.59c; oval, 30.09c; electrodeposited, 29.84c; cast, 29.59c.

Copper Cyanide: 70-71% Cu, 100-lb drums, 44.00c, fob Niagara Falls, N. Y.

Sodium Cyanide: 96-98%, ½-oz ball, in 200 lb drums, 1 to 900 lb, 15.00c; 1000 to 19,900 lb, 14.00c fob Niagara Falls, N. Y.

Copper Carbonate: 54-56% metallic Cu; 50 lb bags, up to 250 lb, 25.00c; over 250 lb, 24.00c, fob Cleveland.

Nickel Anodes: Rolled oval, carbonized, carloads, 48.00c; 10,000 to 30,000 lb, 49.00c; 3000 to 10,000 lb, 50.00c; 500 to 3000 lb, 51.00c; 100 to 500 lb, 53.00c; under 100 lb, 56.00c; fob Cleveland. Add 1 cent for rolled depolarized.

Nickel Chloride: 100-lb kegs, 23.50c; 275-lb, or 500-lb bbls. 21.50c, fob Cleveland.

Tin Anodes: Bar, 1000 lb and over 110.00c; 500 to 999 lb, 110.50c; 200 to 499 lb, 111.00c; less than 200 lb, 112.50c; ball, 1000 lb and over, 112.25c; 500 to 999 lb. 112.75c; 200 to 499 lb, 113.25c; less than 200 lb, 114.75c, fob Sewaren, N. J.

Sodium Stannate: 25 lb cans only, less than 100 lb, to consumers and resellers, 67.4c; 100 or 300 lb drums only, 100 to 500 lb, to consumers 59.2c, to resellers 54.8c; 600 to 1900 lb, to consumers 56.8c, to resellers 52.5c; 2000 to 9900 lb, to consumers 55.0c, to resellers 50.9c; 10,000 lb or more l.c.l., to consumers 53.9c, to resellers 49.9c; carloads, to consumers 52.7c, to resellers 48.7c. Prices fob Sewaren, N. J.

Zinc Cyanide: 100-lb drums 37.25c, fob Cleveland; 37.00c, Detroit; 36.00c, fob Philadelphia.

Stannous Sulphate: Less than 2000 lb, in 100 lb kegs, 96.50c, in 400 lb bbl, 95.50c; more than 2000 lb, in 100 lb kegs, 95.50c, in 400 lb bbl, 94.50c.

Scrap Metals

BRASS MILL ALLOWANCES
(Based on 21.50c, Conn., for copper)

Prices in cents per pound for less than 15,000 lb fob shipping point.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	19.125	19.125	18.375
Yellow brass	15.625	15.375	14.750
Commercial Bronze			
95%	18.125	17.875	17.375
90%	17.625	17.375	16.875
Red brass			
85%	17.500	17.250	16.750
80%	17.250	17.000	16.500
Best Quality (71-79%)	16.625	16.375	15.875
Muntz Metal	14.750	14.500	14.000
Nickel silver, 5%	16.500	16.250	8.250
Phos. bronze, A. B.	20.750	20.500	19.500
Naval brass	15.250	15.000	14.500
Manganese bronze	15.250	15.000	14.375

BRASS INGOT MAKERS BUYING PRICES
(Cents per pound, fob shipping point, carload lots)

No. 1 copper 18.25, No. 2 copper 17.25, light copper 16.25, composition red brass 14.50-14.75, auto radiators 11.75-12.00, heavy yellow brass 10.50-10.75, brass pipe, 11.50-11.75.

REFINERS' BUYING PRICES
(Cents per pound, delivered refinery, carload lots)

No. 1 copper 18.50, No. 2 copper 17.50, light copper, 16.50, refinery brass (60% copper), per dry copper content 16.75.

DEALERS' BUYING PRICES
(Cents per pound, New York, in ton lots or more)

Copper and Brass: Heavy copper and wire No. 1 16.50-16.75, No. 2 15.50-16.00, light copper 14.25-14.50, No. 1 composition red brass 12.50-13.00, No. 1 composition turnings 12.00-12.50, mixed brass turnings 7.25-7.50, new brass clippings 12.50-13.00, No. 1 brass rod turnings 10.00-10.50, light brass 6.50-7.00, heavy yellow brass 9.00-9.25, new brass rod ends 10.50-11.00, auto radiators, unsweated 10.00-10.25, cocks and faucets 10.00-10.25, brass pipe 9.75-10.25.

Lead: Heavy 15.50-16.00, battery plates 9.25-9.75, linotype and stereotype 16.75-17.25, electrotype 15.00-15.50, mixed babbitt 14.25-14.75, solder joints, 18.75-19.50.

Zinc: Old zinc 5.50-6.00, new die cast scrap 4.75-5.50, old die cast scrap 2.75-3.25.

Tin: No. 1 pewter 64.00-67.00, block tin pipe 82.00-84.00, auto babbitt 50.00-53.00, No. 1 babbitt 51.00-54.00, siphon tops 50.00-52.00.

Aluminum: Clippings 2S 10.50-11.00, old sheets 8.50-9.00, crankcases 8.50-9.00, borings and turnings 4.00-4.50, pistons, free of struts, 8.50-9.00.

DAILY PRICE RECORD

	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
May Avg.	21.500	17.325	12.000	94.000	15.000	33.700	33.750	74.625
June 1-17	21.500	17.30-17.35	12.000	103.000	15.000	35.00	33.750	74.625

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. E. St. Louis; Zinc, prime western, del. St. Louis; Tin, Straits, del. New York; Aluminum, primary ingots, 99%, del.; Antimony, bulk, fob Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery, unpacked; Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

OPEN MARKET PRICES, IRON AND STEEL SCRAP

Prices are dollars per gross ton, including broker's commission, delivered at consumer's plant except where noted.

PITTSBURGH

No. 1 Heavy Melt. Steel	$40.00-40.50*
No. 2 Heavy Melt. Steel	40.00-40.50*
No. 1 Busheling	40.00-40.50*
Nos. 1, 2 & 3 Bundles	40.00-40.50*
Machine Shop Turnings	36.50-37.00
Mixed Borings, Turnings	36.50-37.00
Short Shovel Turnings.	37.00-37.50
Cast Iron Borings	36.50-37.00
Bar Crops and Plate	47.50-48.00
Low Phos. Steel	47.50-48.50
Heavy Turnings	39.50-40.00

Cast Iron Grades

No. 1 Cupola	64.00-65.00
Charging Box Cast	53.00-54.00
Heavy Breakable Cast.	56.00-58.00
Unstripped Motor Blocks	52.00-53.00
Malleable	69.00-70.00
Brake Shoe	52.00-53.00
Clean Auto Cast	58.00-59.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	41.00-41.50
R.R. Malleable	75.00-80.00
Axles	51.50-52.00
Rails, Rerolling	56.00-58.00
Rails, Random Lengths	54.00-56.00
Rails, 3 ft and under	61.50-62.00
Rails, 18 in. and under	62.50-63.50
Railroad Specialties	54.00-55.00
Uncut Tires	52.00-52.50
Angles, Splice Bars	53.00-54.00

* Plus applicable freight springboard.

CLEVELAND

No. 1 Heavy Melt. Steel	$39.50-40.00*
No. 2 Heavy Melt. Steel	39.50-40.00*
No. 1 Busheling	39.50-40.00*
Nos. 1 & 2 Bundles	39.50-40.00*
Machine Shop Turnings	34.50-35.00
Mixed Borings, Turnings	34.00-36.00
Short Shovel Turnings.	35.50-36.00
Cast Iron Borings	35.50-36.00
Bar Crops and Plate	44.50-45.00
Punchings & Plate Scrap	44.50-45.00
Heavy Turnings	39.50-40.50
Alloy Free Turnings	37.50-38.50
Cut Structurals	46.00-49.00

Cast Iron Grades

No. 1 Cupola	67.00-69.00
Charging Box Cast	58.00-60.00
Stove Plate	58.00-60.00
Heavy Breakable Cast.	54.00-56.00
Unstripped Motor Blocks	58.00-60.00
Malleable	73.00-75.00
Brake Shoes	52.00-53.00
Clean Auto Cast	68.00-70.00
No. 1 Wheels	58.00-60.00
Burnt Cast	56.00-57.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	40.50-41.50*
R.R. Malleable	73.00-78.00
Rails, Rerolling	57.00-58.00
Rails, Random Lengths	56.00-57.00
Rails, 3 ft and under	61.00-63.00
Cast Steel	56.00-58.00
Railroad Specialties	53.00-55.00
Uncut Tires	56.00-57.00
Angles, Splice Bars	57.00-59.00

* Plus applicable freight springboard.

VALLEY

No. 1 Heavy Melt. Steel	$40.00-40.50*
No. 2 Heavy Melt. Steel	40.00-40.50*
No. 1 Bundles	40.00-40.50*
Machine Shop Turnings	34.50-35.50
Short Shovel Turnings.	36.50-37.00
Cast Iron Borings	36.00-36.50
Low Phos.	46.00-47.50*

Railroad Scrap

No. 1 R.R. Heavy Melt.	40.50-41.50*

* Plus applicable freight springboard.

MANSFIELD

Machine Shop Turnings	$35.00-35.50
Short Shovel Turnings.	37.00-37.50

CINCINNATI

No. 1 Heavy Melt. Steel	$39.50
No. 2 Heavy Melt. Steel	39.50
No. 1 Busheling	39.50
Nos. 1 & 2 Bundles	39.50
Machine Shop Turnings	33.50
Mixed Borings, Turnings	32.50
Short Shovel Turnings.	35.50
Cast Iron Borings	34.50

Cast Iron Grades

No. 1 Cupola Cast	55.00
Charging Box Cast	43.00
Heavy Breakable Cast.	50.00
Stove Plate	47.00
Unstripped Motor Blocks	45.00
Brake Shoes	45.00
Clean Auto Cast	55.00
Drop Broken Cast	60.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	40.50
R.R. Malleable	68.00
Rails, Rerolling	53.00
Rails, Random Lengths	50.00
Rails, 18 in. and under	60.00

DETROIT

(Dealers buying prices, fob shipping point)

No. 1 Heavy Melt. Steel	$35.00-35.50
No. 1 Busheling	35.00-35.50
Nos. 1 & 2 Bundles	35.00-35.50
No. 3 Bundles	35.00-35.50
Machine Shop Turnings	29.00-29.50
Mixed Borings, Turnings	29.00-29.50
Short Shovel Turnings.	30.00-30.50
Cast Iron Borings	30.00-30.50
Punchings & Plate Scrap	40.00-40.50

Cast Iron Grades

No. 1 Cupola Cast	58.00-60.00
Heavy Breakable Cast.	48.00-50.00
Clean Auto Cast	60.00-62.00

BUFFALO

No. 1 Heavy Melt. Steel	$43.00-45.00
No. 2 Heavy Melt. Steel	39.75-40.25
No. 1 Busheling	39.75-40.25
No. 1 & 2 Bundles	39.75-40.25
Machine Shop Turnings	34.75-35.25
Mixed Borings, Turnings	34.75-35.25
Cast Iron Borings	35.50-36.00
Short Shovel Turnings.	35.50-36.00
Low Phos.	44.75-45.25

Cast Iron Grades

No. 1 Cupola	64.00-65.00
Mixed Cupola	60.00-62.00
Heavy Breakable Cast.	55.00-57.00
Malleable	70.00-75.00
Clean Auto Cast	62.00-64.00

Railroad Scrap

Rails, 3 ft. and under.	60.00-61.00
Railroad Specialties	51.00-53.00

PHILADELPHIA

No. 1 Heavy Melt. Steel	$42.00-43.00
No. 2 Heavy Melt. Steel	39.00
No. 1 Busheling	39.00
Nos. 1 & 2 Bundles	39.00
No. 3 Bundles	37.00
Machine Shop Turnings	34.00-35.00
Mixed Borings, Turnings	34.00-35.00
Short Shovel Turnings.	34.00-35.00
Bar Crop and Plate	47.50-48.00
Punchings & Plate Scrap	48.00-48.50
Cut Structurals	47.50-48.00
Elec. Furnace Bundles.	44.00-44.50
Heavy Turnings	43.00-43.50
No. 1 Chemical Borings	42.00-43.00

Cast Iron Grades

No. 1 Cupola Cast	63.00-65.00
No. 1 Machinery Cast	66.00-67.00
Charging Box Cast	62.50-63.50
Heavy Breakable Cast.	62.50-63.50
Unstripped Motor Blocks	59.50
Malleable	76.00-78.00
Clean Auto Cast	64.00
No. 1 Wheels	68.00-70.00

NEW YORK

(Brokers buying prices, fob shipping point)

No. 1 Heavy Melt. Steel	$34.50
No. 2 Heavy Melt. Steel	34.50
No. 1 Busheling	34.50
Nos. 1 & 2 Bundles	34.50
No. 3 Bundles	32.50
Machine Shop Turnings	28.50-29.00
Mixed Borings, Turnings	28.50-29.00
Short Shovel Turnings.	30.50-31.00
Punchings & Plate Scrap	40.00-41.00
Cut Structurals	40.00-41.00
Elec. Furnace Bundles.	40.00-41.00

Cast Iron Grades

No. 1 Cupola Cast	55.00-57.00
Charging Box Cast	56.00-58.00
Heavy Breakable	56.00-58.00
Unstripped Motor Blocks	52.50-53.50
Malleable	68.00-69.00

BOSTON

(Fob shipping point)

No. 1 Heavy Melt. Steel	$31.90
No. 2 Heavy Melt. Steel	31.90
No. 1 Bundles	31.90
No. 1 Busheling	31.90
Machine Shop Turnings	26.90
Mixed Borings, Turnings	26.90
Short Shovel Turnings.	28.90
Bar Crops and Plate	35.00-37.00
Punchings & Plate Scrap	35.00-37.00
Chemical Borings	37.00-37.50

Cast Iron Grades

No. 1 Cupola Cast	50.00-52.00
Heavy Breakable Cast.	53.00
Stove Plate	50.00
Unstripped Motor Blocks	48.00
Clean Auto Cast	50.00-52.00

CHICAGO

No. 1 Heavy Melt. Steel	$39.00-39.50
No. 2 Heavy Melt. Steel	39.00-39.50
No. 1 Bundles	39.00-39.50
No. 2 Bundles	39.00-39.50
No. 3 Bundles	37.00-37.50
Machine Shop Turnings	34.00-34.50
Mixed Borings, Turnings	34.00-34.50
Short Shovel Turnings.	36.00-36.50
Cast Iron Borings	35.50-36.00
Bar Crops and Plate	46.50-47.00
Punchings	48.00-48.50
Elec. Furnace Bundles.	40.00-40.50
Heavy Turnings	38.50-39.00
Cut Structurals	44.00-44.50

Cast Iron Grades

No. 1 Cupola Cast	67.00-70.00
Clean Auto Cast	67.00-70.00
No. 1 Wheels	61.00-62.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	41.25-44.25
Malleable	75.00-76.00
Rails, Rerolling	54.00-55.00
Rails, Random Lengths	51.00-52.00
Rails, 3 ft and under	56.00-57.00
Rails, 18 in. and under	58.00-59.00
Railroad Specialties	52.00-53.00
Angles, Splice Bars	53.00-54.00

ST. LOUIS

No. 1 Heavy Melt. Steel	$40.50-41.00
No. 2 Heavy Melt. Steel	37.50-38.00
Machine Shop Turnings	32.50-33.50
Short Shovel Turnings.	34.50-35.50

Cast Iron Grades (Fob shipping point)

No. 1 Cupola Cast	65.00-67.00
Mixed Cast	59.00-60.00
Heavy Breakable Cast.	55.00-56.00
Brake Shoes	57.00-58.00
Clean Auto Cast	65.00-67.00
Burnt Cast	59.00-60.00

Railroad Scrap

R.R. Malleable	65.00-70.00
Rails, Rerolling	50.50-52.50
Rails, Random Lengths	50.00-51.00
Rails, 3 ft and under	56.00-58.00
Uncut Tires	48.00-49.00
Angles, Splice aBrs	55.00-56.00

BIRMINGHAM

No. 1 Heavy Melt. Steel	$37.50
No. 2 Heavy Melt. Steel	37.50
No. 1 Busheling	37.50
Nos. 1 & 2 Bundles	37.00
No. 3 Bundles	35.00
Long Turnings	24.50
Short Shovel Turnings.	26.00-27.00
Cast Iron Borings	25.00
Bar Crops and Plate	40.00
Cut Structurals	38.50

Cast Iron Grades

No. 1 Cupola Cast	63.00
Stove Plate	60.00-62.00
No. 1 Wheels	59.00-61.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	38.00
R.R. Malleable	nom.
Axles, Steel	50.00
Rails, Rerolling	53.00-55.00
Rails, Random Length.	45.00-48.00
Rails, 3 ft and under	53.00-55.00
Angles and Splice Bars	52.00-53.00

SAN FRANCISCO

No. 1 Heavy Melt. Steel	*$25.00
No. 2 Heavy Melt. Steel	*25.00
No. 1 Busheling	*25.00
Nos. 1 & 2 Bundles	*25.00
No. 3 Bundles	*19.00
Machine Shop Turnings	*15.50
Bar Crops and Plate	25.00
Cast Steel	25.00
Alloy Free Turnings	15.50
Cut Structurals	25.00
Tin Can Bundles	19.00

Railroad Scrap

No. 1 Heavy Melting	26.00
Axles	32.00
Rails, Random Lengths	26.50
Uncut Tires	33.50

* Fob California shipping point.

SEATTLE

No. 1 Heavy Melt. Steel	$26.00
No. 2 Heavy Melt. Steel	26.00
No. 1 Busheling	26.00
Nos. 1 & 2 Bundles	22.00-23.00
No. 3 Bundles	22.00-23.00
Machine Shop Turnings	14.50-16.50
Mixed Borings, Turnings	14.50-16.50
Punchings & Plate Scrap	26.00-28.00
Cut Structurals	26.00-28.00

Cast Iron Grades

No. 1 Cupola Cast	40.00
Charging Box Cast	25.00
Heavy Breakable Cast.	24.00
Stove Plate	25.50
Unstripped Motor Blocks	24.00
Malleable	30.00
Brake Shoes	30.00
Clean Auto Cast	30.00
No. 1 Wheels	26.50

Railroad Scrap

No. 1 R.R. Heavy Melt.	22.00
Railroad Malleable	30.00
Rails, Random Lengths	21.50
Angles and Splice Bars	23.00

LOS ANGELES

No. 1 Heavy Melt. Steel	$25.00
No. 2 Heavy Melt. Steel	25.00
Nos. 1 & 2 Bundles	25.00
Machine Shop Turnings	16.00
Mixed Borings, Turnings	15.50-16.00
Punchings & Plate Scrap	28.00
Elec. Furnace Bundles.	28.00

Cast Iron Grades

No. 1 Cupola Cast	35.00-36.00

HAMILTON, ONT.

(Ceiling prices, delivered)

Heavy Melt.	$22.00
No. 1 Bundles	22.00
Mechanical Bundles	20.00
Mixed Steel Scrap	19.00
Mixed Borings, Turnings	17.00
Rails, Remelting	28.00
Rails, Rerolling	26.00
Bushelings	17.00
Bushelings, new factory, prep'd	21.00
Bushelings, new factory, unprep'd	16.00
Short Steel Turnings	17.00

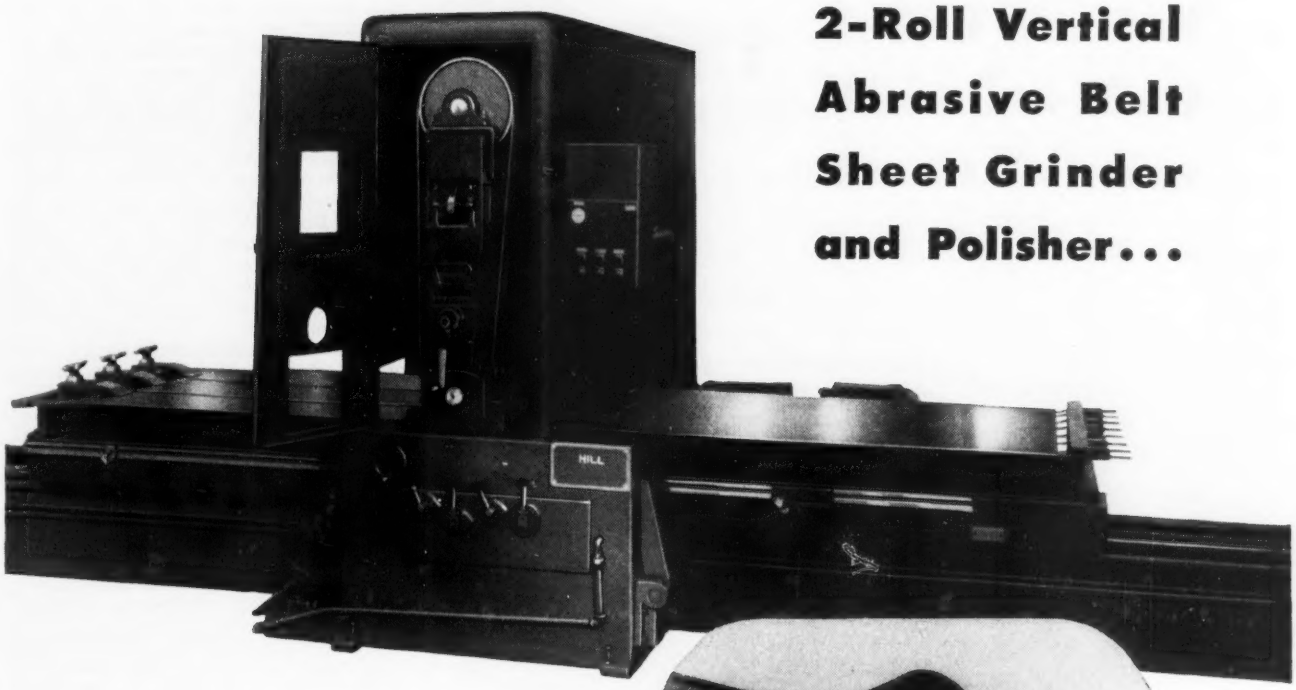
Cast Iron Grades*

No. 1 Cast	42.00-48.00
No. 2 Cast	35.00-37.00

* Removed from price control Aug. 9, 1947; quoted on basis of fob shipping point.

Increase Production with

the New "HILL" 2-Roll Vertical Abrasive Belt Sheet Grinder and Polisher...



The "Hill" 2-Roll Hydraulic Sheet Machine is built with a rigid, all fabricated steel table, actuated by 100% hydraulic drive. The table action is unusually smooth, quick on reversal and accurately controllable for speed. The "Hill" 2-Roll Vertical Head design covers basically an upper steel idler roli and a lower rubber-covered contact or work roll ... over which the 126" long abrasive belt travels. The belt is maintained centrally on these two rolls by means of "Hill" Patented pneumatic belt centering device. The contact roll, being the driving roll, minimizes belt slippage. A steel billy roll, located directly below the contact roll, is raised and lowered through air cylinder operation and exerts the necessary grinding pressure. Machines are offered in table widths 36", 48" and 60"; also in lengths 60" to 240". "Hill" 2-Roll Vertical Abrasive Belt Grinding and Polishing Machines also made in two other designs—Bar or

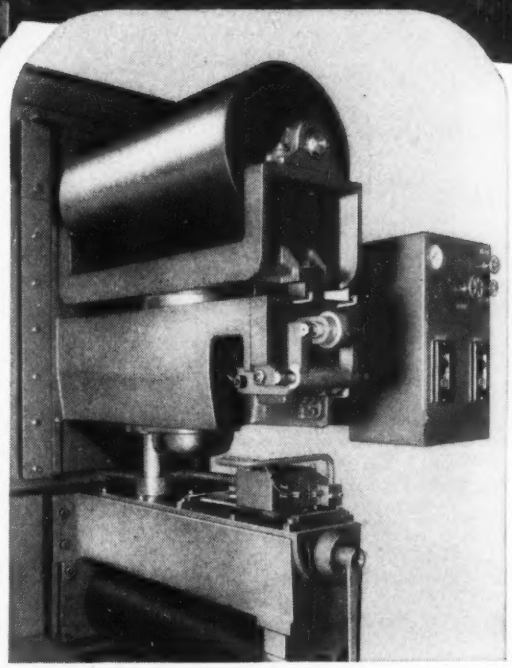


Plate Grinder and Polisher (Pinch Roll Type) and Strip Grinder and Polisher (Coiler Type).

Recommendations, Estimates and Bulletins on request. Ask for Bulletin G. P. 3-S.

THE HILL ACME COMPANY

6400 BREAKWATER AVENUE • CLEVELAND 2, OHIO

"HILL" GRINDING AND POLISHING MACHINES • HYDRAULIC SURFACE GRINDERS • ALSO MANUFACTURERS OF "ACME" FORGING THREADING • TAPPING MACHINES • "CANTON" ALLIGATOR SHEARS • PORTABLE FLOOR CRANES • "CLEVELAND" KNIVES • SHEAR BLADES

An Oppossum

is safe with his feet off the ground...

. . . but a worker must keep his feet firmly on the ground if he is to do his work with complete safety. You can keep injuries due to slips and falls to a minimum in your plant by installing U·S·S Multigrip Floor Plate.

Multigrip offers skid resistance and traction in every direction, wet or dry. Workers start and stop, promptly . . . safely. And the flat-topped risers are comfortable under-foot, lessen fatigue.

Get further information about Multigrip from your nearest steel warehouse or write to us direct.

CARNEGIE-ILLINOIS STEEL CORPORATION
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Tennessee Coal, Iron & Railroad Company, Birmingham, *Southern Distributors*
United States Steel Export Company, New York
8-537

UNITED STATES STEEL

Sheets, Strip . . .

Increased freight rates and basing point shifts add to squeeze on supply

Sheet Prices, Page 148

New York—Sheet consumers continue to feel the further squeeze on supply which has been set up by the increase in freight rates this spring and the establishment a few weeks ago of an eastern basing point on cold rolled sheets—a combination that has resulted in most, if not all, midwestern mills channeling an increasing tonnage to ready markets nearer their own plants. Some sellers very clearly are not meeting eastern basing point delivered prices, using inland bases or f.o.b. mill prices and even then restricting sales to regular customers.

Stainless sheet deliveries vary, some mills offering shipments within six weeks and others offering 10 to 12 weeks. One producer is quoting stainless strip at 10 weeks delivery, although offering stainless sheets for shipment within six weeks.

Boston—While flat-rolled backlogs with some producers are somewhat thinner, there is no easing in sheets or strip; only stainless and electrocoated products even approximate demand. A few producing consumer goods are taking new orders in less volume, but are taking all steel available and scattered reaction is not reflected at mill level. During vacation periods next month, most steel fabricators will take in steel if shipped. Buyers are less willing to pay 10 and 12 cents for gray market steel and off sizes and grades are finding a tightening market; to this extent, some easing in pressure for steel may be noted. Low-alloy high-strength steel tonnage is offered in lighter volume.

Philadelphia — Pressure for sheets may ease a trifle in July since a number of consumers are contemplating mass vacations for a week or two next month. However, this easing should prove to be little more than nominal, for buyers stand ready to take in as much tonnage as possible regardless of vacations.

Chicago—The inadequate volume of mill shipments of sheet and strip and the imposition of reduced quotas for third quarter is forcing consumers to adjust their production schedules accordingly. It is also stimulating interest in gray market offerings and conversion arrangements. A local mill, which has been engaging in conversion rolling for accredited interests and which recently opened its books for conversion space for last half of the year, now states that the last of the available capacity for fourth quarter has been taken up. Producers of flat-rolled products report that consumers are taking all of the tonnage allotted to them; in other words, cancellations in sheets and strip are practically nonexistent.

Cleveland — Still feeling effects of the coal strike, one producer has blanked out July on carbon steel sheets as well as most other products and is cutting August allotments 10 per cent below those of June. The company hopes to complete delivery of June orders in July

so that by August it can again become current on shipments. To make adjustments for production declines during summer vacations, another producer has reduced its July allotments to customers.

Cincinnati — Full effect of government-sponored programs has not yet hit district sheet mills, already beset by demands for tonnage in excess of supplies. The pinch as reflected in the large carryover and smaller third quarter allotments, is in part a throw-back to production losses in the spring The Newport, Ky., steelworks of the International Detrola Corp. has just put into operation an electric furnace.

St. Louis — Sheet consumers are worried at the possibility increasing government pressure on the housing program may hurt their allocations. There have been no changes in local mill allocations to customers yet, but they don't discount the chance the use of housing as a political weapon may make the little manufacturer's steel scarcity difficulties worse. The small consumers lately have been trying to put more pressure on mills with the apparent support of a Senate Small Business Committee. Most buyers in this area are relatively small businessmen and the situation long since has been so tight that any newcomer squeezing in merely meant another being squeezed out. Sheet output continues to increase moderately, with prospect a 40,000-ton monthly capacity rate may be reached by November.

Steel Bars . . .

Bar Prices, Page 148

New York—Some hot carbon bar producers are going into the new quarter with at least a month's carryover, with the market in general as tight as it has been at any time this year. Stringency also applies to cold-drawn carbon bars. Certain leading sellers of cold-drawn bars are now sold up to November on all sizes with even more extended deliveries on small flats and rounds under ⅜ inches in diameter.

Hot alloy bar deliveries are more extended, with sellers quoting August and September on the electric furnace product and beyond in the case of open-hearth material. One producer, in fact, is unable to offer anything before November on the open-hearth grades. Cold-finished alloy deliveries are available in late August and September, with some producers having little to offer on certain specifications before October.

Stainless steel bar schedules are tightening, one producer now offering eight to 10 weeks delivery as against four weeks a while ago. This tightening is ascribed in part to stepping up in the defense program. On items which have been in easy demand all along, such as stainless bars, rearmament work is rather quickly reflected, even though such work is in no sense on a mass production basis.

Boston—Most hot-rolled carbon bar allocations for the third quarter will be reduced by deductions of unshipped or carryover tonnage. On paper, quotas are generally the same as the second; in practice, smaller. Deducted tonnage with some mills will approximate 30 per cent. Cold-rolled being

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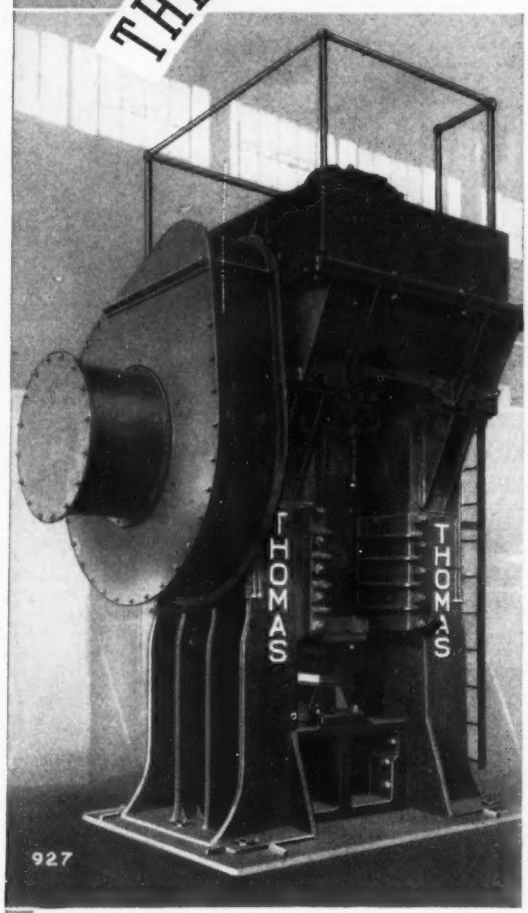

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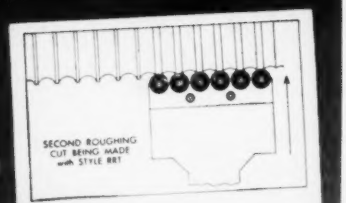
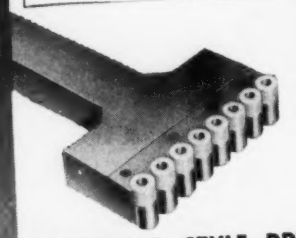
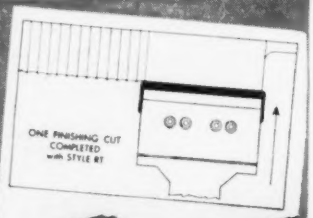
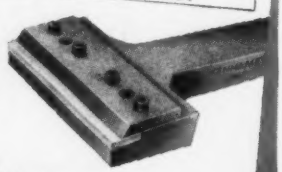




ROUGHING STYLE RRT

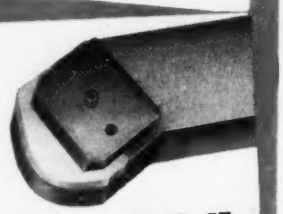
Made in four standard widths—4", 6", 8", and 10".





FINISHING STYLE RT

Made in four standard widths—4", 6", 8", and 10".



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in slightly better supply than hot, there is some substitution of that grade, but most mills are reluctant to contribute toward a fictitious market in either cold-drawn carbon or alloys.

Pittsburgh—Merchant carbon bar sellers report continued heavy demand from all sources throughout the full range of sizes. Pressure for deliveries in the large size classifications is just as heavy as that prevailing in smaller sizes. Most sellers have curtailed order acceptance throughout third quarter in effort to make up first-half carryover tonnage and to allow for shutdown of bar mills due to vacation periods. No adjustment was made to offset possible production loss resulting from coal strike threat. Cold-finished carbon and alloy bar order backlogs continue to mount, although a leveling off from the sharp upward trend is noted. Some sellers will not make definite delivery promises on cold-finished bars under 3 inches, while one interest has gone on a monthly allocation basis. Alloy bar producers also report continued heavy demand, with deliveries on electric furnace steels extended 10 to 12 weeks, while open-hearth alloys cannot be had until October and November.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 148

Pittsburgh — Major producers of concrete reinforcing bars continue to accept new orders on a very limited tonnage basis due to restricted mill allotments for rolling schedules. A number of reinforcing bar inquiries have been reported for flood control work. New demand for plant expansion also is increasing. Over 500 tons of concrete bars are involved in a new $1.5 million office building for United Engineering & Foundry Co., Pittsburgh.

Seattle — Rolling mills have substantial backlogs, especially at Bethlehem Pacific Coast Steel Corp.'s local plant where the mill resumed operations this week after a fortnight shutdown due to an equipment breakdown. The plant is entirely out of inventory and will take some time to make up the loss of output. No new work of sizable tonnage of reinforcing bars has been booked. Northwest Steel Rolling Mills Inc. reports a volume of small jobs and backlog static. This plant will close the first half of July for vacation and annual overhaul.

Tin Plate . . .

Tin Plate Prices, Page 149

Pittsburgh — Tin plate producers are expected to enter third quarter with relatively little carryover tonnage on their books. Output throughout first half was well sustained despite industrial gas shortages and coal strike in April. No definite tonnage commitments have yet been made public regarding ERP requirements. Domestic demand shows no indication of easing from any quarter, although some of the paint container manufacturers are no longer pressing for additional tonnage over and above their allotments as is generally the case with all other consumer groups.

No action price-wise in tin plate has yet been reported by Republic Steel Corp. or Granite City Steel Co. West Coast tin plate price base is expected to be announced by Columbia Steel Co. some time this summer. At this time it is not definitely known exactly when Columbia will begin producing tin plate. Present West Coast tin plate prices are based on Sparrows Point plus rail and ocean rates, wharfage, handling, switching, etc. On some items in black plate, however, Pittsburgh is the governing price base.

Plates . . .

Alan Wood Steel Co. cuts floor plate price $3 a ton to 4.05c, Pittsburgh

Plate Prices, Page 149

Philadelphia — Alan Wood Steel Co., Conshohocken, Pa., has reduced prices on floor plate $3 a ton to 4.05c, Pittsburgh. This is in line with action taken a few weeks ago by the leading producer, with at least one other producer meanwhile having reduced prices $3 a ton and still another $5 a ton.

Situation in plain carbon plates is unchanged, with pressure for tonnage as strong as ever. One leading district shipyard continues to inquire for several thousand tons of plates for shipment in the last half without success. However, this consumer's requirements may be met in part once plate producers open books for fourth quarter. Most plate mills will have a substantial carryover at the end of this quarter, although one district seller's arrearages probably will not amount to more than two weeks' production. This interest has been particularly conservative in accepting commitments, with a result his position is substantially better than most sellers.

Boston — As more plate tonnage is scheduled for specific programs, less is available for general distribution and this applies not only to carbon but also to low-alloy and special grades. The former has tightened substantially. The Navy is in the market again for plate, including hull steel, boiler and floor plates. Third quarter allocations are lower in most instances; the car building program continues to drain off a substantial volume while commitments for large diameter steel pipe are mounting. A broad range of prices continues to confuse buyers, but even the higher quotations find a ready market, steel rather than price being the concern of the average plate fabricator.

Pittsburgh — With possible exception of sheets and strip, the demand-supply relationship in carbon plates is the most critical of all steel items. Pressure for delivery for such major programs as railroads, line pipe and tankers has become more acute in recent weeks, while no letup in demand for standby fuel tanks and equipment, barges, and heavy industrial machinery is noted. Increased pipe production by Republic Steel Corp. at Gadsden, Ala., has forced that company to restrict its plate distribution. This situation has increased demand for plates among other producers. One large plate producer is reported to

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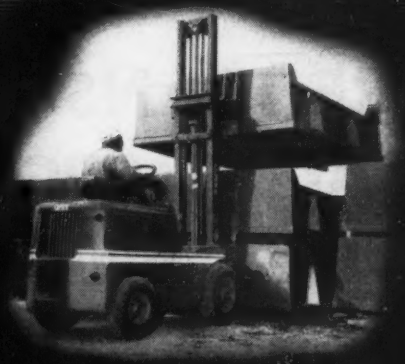

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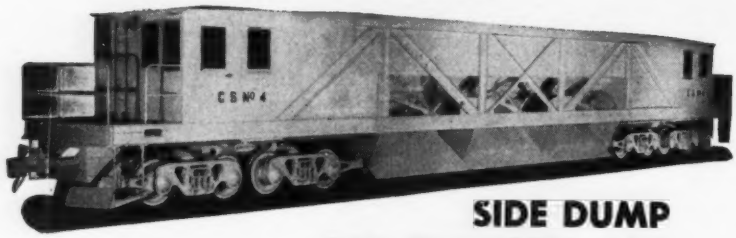

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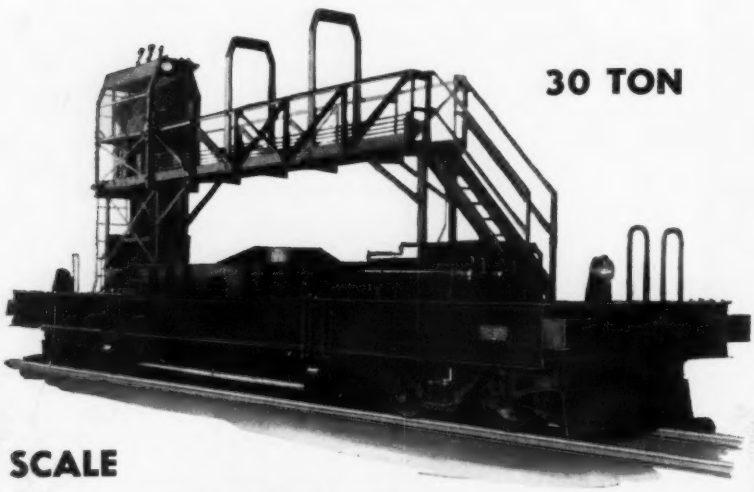

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have temporarily discarded its plan to enter the pipe fabrication field due to the record breaking demand for plates.

Seattle — Plate fabricators report a good run of jobs for boiler casings, tanks and pulp mill equipment but new business is being restricted in line with availability of supplies which are increasingly more acute. Plants are making every effort to take care of regular customers but are hesitant in making heavy commitments.

Tubular Goods . . .

Tubular Goods Prices, Page 149

New York—Stringency in merchant pipe continues, with seamless and butt weld pipe extremely difficult to obtain. One large producer in an effort to become current on butt weld has blanked out (for order acceptances) the entire third quarter and has reduced fourth quarter allotments by 10 per cent. This applies to direct consumer business. This seller on seamless pipe has blanked out both third and fourth quarters on consumer business.

For jobber accounts, this producer has blanked out July on butt weld and has reduced allotments for the remaining months of the year by 10 per cent; and on seamless has blanked out the third quarter but will accept orders for the following three-month period.

Deliveries on hot-finished boiler tubing are far extended, with one leading producer out of the market for the remainder of this year, and in a tight position on cold-drawn carbon boiler tubing, except in the small diameters.

Cold-drawn mechanical tubing shipments are readily available on some sizes and extended on others. One seller, for instance, can offer three to five weeks shipment on ½ inch outside diameter and smaller (14 to 20 gage) but can do nothing over the remainder of this year on sizes running over four inches outside diameter and heavier than ¼ inch. Shipments on hot mechanical tubing fall into the last quarter and beyond.

Boston—Demand for cast pipe is holding at a high level for this season; utilities are buying actively, notably gas companies unable to get steel pipe. With a mechanical joint, cast pipe is being used in larger diameters, 8, 10 and 12-inch, whereas its use generally has been in sizes under these diameters. Wrought iron pipe is also active and in some degree is also helped by the shortage in steel pipe The latter generally lags on delivery schedules with few exceptions.

Pittsburgh—Record demand for line pipe is one of the factors creating critical tight supply situation in plates. Some producers report order backlogs extend into 1951 in the large diameter line pipe sizes. Unusually heavy demand continues for most tubular specialty items; hot-rolled and cold-drawn electric weld boiler tube items are extended 10 to 12 weeks. Pressure tubing supply particularly is very tight.

Seattle — Cast iron pipe agencies report a good demand, but in the matter of delivery other types have the advantage and for this reason considerable business has been diverted.

Structural Shapes . . .

Structural Shape Prices, Page 149

Philadelphia — Structural fabricators report increasing difficulty in obtaining shapes, as requirements are heavier and receipts from the mills show little, if any, improvement. Some fabricators ascribe existing shortage as being due primarily to the fact that shapes are a low-profit item and that producers, therefore, are not devoting enough raw steel to shape production. Fabricators also report they are not able to supplement their stocks adequately by purchases from jobbers, who likewise are not getting the shape tonnage necessary. Various jobs are being held up at fabricators' shops because of unbalanced inventory.

The large Delaware River Memorial bridge, south of Wilmington, Del., involving in excess of 40,000 tons of steel, is going ahead after having been held up some weeks ago. Merritt-Chapman & Scott Inc., New York, has been awarded an $11,400,936 contract to erect the tower piers and anchorage foundations, a job that will require 1900 tons of reinforcing steel and between 2000 and 3000 tons of plate and shape caissons. Dravo Corp., Pittsburgh, was originally awarded this contract, but withdrew last April because of difficulty in obtaining steel. There is nothing definite yet as to when bids will be taken on the superstructure.

Boston — Structural fabricating shops are finding it increasingly difficult to quote on delivery because of the uncertainty of plain material tonnage. Allocations have been reduced for third quarter and fill-in tonnage is not in sight. Inquiry is holding fairly well with state bridge estimating active; most of them are small projects, the largest being 8500 tons, express highway. Contracts include 2000 tons, placed by a Boston contractor-engineer for industrial projects outside this district.

New York — Structural buying is improving, with relatively more private work than public work coming out than a few weeks ago. Most fabricators have backlogs ranging from five to six months and complain of difficulty in obtaining an adequate supply of shapes to insure full production. Awards in the immediate district during the past week generally involved lots of 800 tons or less.

Pittsburgh — Volume of new inquiries for plant expansion appears to be tending upward. Many companies late last year shelved expansion programs because of high cost and uncertain delivery promises on structurel steel items. Apparently these companies have given up hope of a more realistic price and delivery situation developing in the near future and have decided to go ahead with their expansion plans. Most structural steel items. Apparently steel supply is the major "bottleneck" at this time. Due to this situation, some fabricators have fallen considerably behind schedule. Mills have limited order acceptance throughout third quarter in an effort to clear up carryover tonnage and to offset production loss due to vacations during that period.

Seattle — Fabricating plants have sufficient backlog to insure normal

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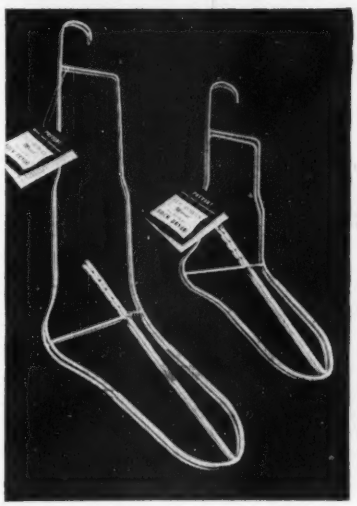

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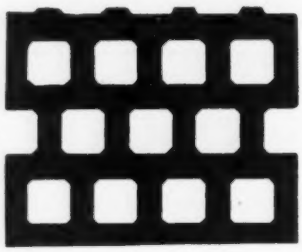

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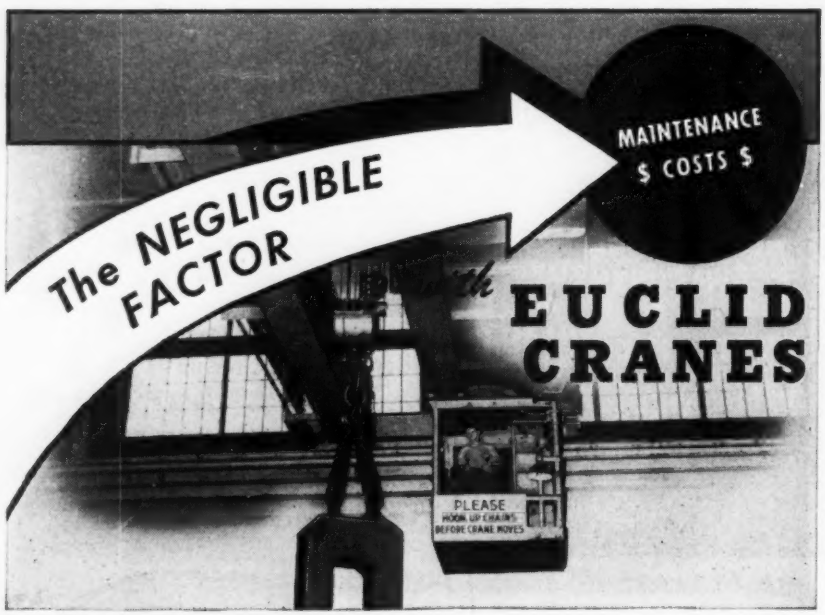

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operations for some time and, because of the shortage of steel, they are not actively seeking new contracts. Management is pessimistic about the steel supply for the balance of the year and commitments are predicated on the amount of steel available.

Warehouse . . .

Warehouse Prices, Page 151

Chicago—The comparatively small volume of steel which mills are shipping to warehouses is discouraging to the latter, also to their customers who are pressing continuously and insistently for material. Some consumers are following the practice of submitting to distributors weekly lists of their steel needs in the hope that by this method they may be able to acquire a higher percentage of the items. In face of the reduced third-quarter quotas which mills were obliged to impose on all customers, there can be no optimism over prospects for the next three months and perhaps the remainder of the year. A coal mining cessation, should it occur and be of any duration, would most certainly operate against a better supply situation in fourth quarter. Inventories of carbon and alloy bars, plates, structurals and sheets are low and unbalanced; cold-drawn bars are in comfortable position.

Cleveland — Preparing for the new defense aircraft program, warehouses are taking steps to stock aircraft quality alloy steels. Most distributors who wish to carry these steels will have some stocks in the third quarter. Demand, according to one producer, will be centered in the following alloys: Through-hardening 4130, 4140 and 4340 in bar billet and tubing form; and carburizing and gear type 4615 and 3310 in bars and billets. Also some through-hardening 8630, 8640 and 8740 will be used.

Cincinnati — A shrinkage is noted in mill shipments, to jobbers, of rolled steel although some of the other items are in fair supply. Another severe pinch is in I-beams. Demand is without letup although there is possibility a general trend toward vacation shutdowns, believed partly due to lack of materials, may ease the delivery situation temporarily.

Seattle — Wholesale jobbers note the usual summer slowdown, although business continues in substantial volume. Demand is particularly strong for the hard-to-get items, particularly sheets, pipe, nails, plates and reinforcing bars. Deliveries from Eastern mills are improving, although the effect of lower third quarter allocations will be in evidence soon. The temporary closure of the Bethlehem Seattle plant is severely felt here by jobbers whose orders consequently have been delayed.

Wire . . .

Wire Prices, Page 149

Chicago — About the only development discernible in the wire situation is a somewhat lessened demand for poultry netting, but this is not of sufficient magnitude to cause a lowering of wire mill operation. Building sizes continue to be the most serious shortage of wire products. Call for bale ties and coiled baling wire is increasing due to seasonal influences.

Texas Group Buys Chester Blast Furnace

Philadelphia — Government-owned blast furnace at Chester, Pa., having an annual capacity of 127,000 net tons, has been sold to an oil group in Texas for approximately $300,000. The new operator, it is said, will be known as the Brown Engineering Co., which proposes to exchange pig iron for pipe. A little more than three months will be required to put the furnace in shape, with costs amounting to possibly $600,000. In fact, according to some trade estimates, the program, including purchase price, may run close to $1 million.

H. A. Brassert & Co., New York, consulting engineers, will be in charge of rehabilitation and will also provide an operating crew when the furnace is ready to produce. Work will include installation of boilers, pumps and casting machinery.

Coke supply, it is said, has been definitely assured, probably beehive, with ore to be brought in from abroad. Talk in trade circles that capacity of the furnace may be increased has not been confirmed.

The furnace was rebuilt and relined in 1942, and since that time has been only operated for a period of two and one-half years, that being during the war. It was last operated by the Pittsburgh Ferromanganese Co., Pittsburgh.

Pig Iron . . .

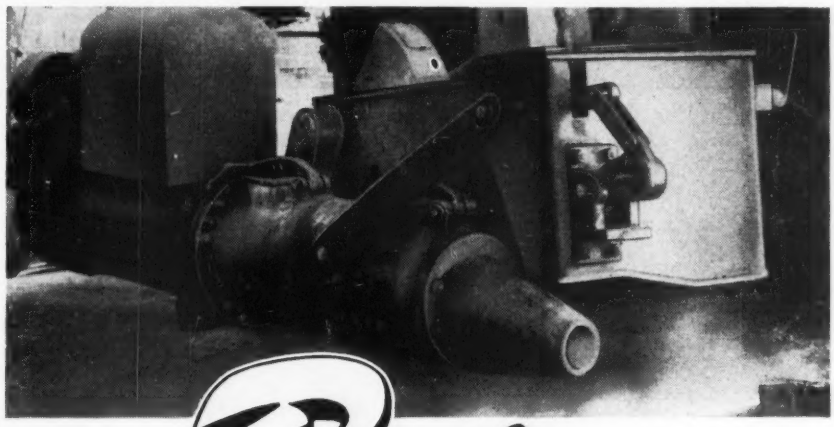
Pig Iron Prices, Page 150

Pittsburgh — Gray iron and malleable foundry shops soon are expected to increase castings prices to offset higher labor, raw material and transportation costs. Foundries in this area granted a wage advance of 8 cents an hour May 1 to AFL molders, etc. At that time they were hopeful of holding prices unchanged, but since that date further price advances have been put into effect on pig iron, coke and scrap; in addition freight rates have been increased. Last price advance put into effect on castings in this area was 1 cent a pound last February. Necessity to advance castings prices occurs at an inopportune time due to the definite easing in demand for gray iron castings. This situation, however, does not yet exist for the malleable group.

Up to late last week, Carnegie-Illinois Steel Corp. and Shenango Furnace Co. had not increased merchant pig iron prices, although such action is anticipated in the trade. Merchant pig iron output currently is back to near normal levels, while overall pig iron output is at nearly 100 per cent of capacity, with but 3 out of 47 blast furnaces in this district out of operation.

Boston — Some foundries' losses are so high on a high scrap melt ratio, the cost of pig iron to improve the situation is a minor factor. The nub is no increase in iron supply is in sight regardless of price. Losses are frequently one-third; a 15,000 pound melt may give but 10,000 pounds of castings and rejects are heavy. Castings are hard and machining time extended. With the exception of slightly more silvery from Buffalo, iron shipments continue restricted to recent quotas. The housing allocations are not expected to change the New England distribution materially.

Philadelphia—District pig iron consumers recently received bad news with the enforced suspension of the smaller of the two furnaces at Swedeland, Pa, for at least 60 days. Trouble developed in the hearth, which had last been relined in 1938, with a result that production had to stop without the stack even being relieved of the burden of its charge. The furnace has an estimated capacity of around 500 tons a day, and, according to present plans, will not be back in operation again until Aug. 15, pending completion of a complete relining job. To add to the complications, the operator was caught with no stocks on hand with which to cushion the requirements of consumers. Meanwhile, the larger furnace will be fully engaged in supplying hot metal for its affiliate, the Alan Wood Steel Co. Suspension of the smaller merchant stack, however, is at least having the effect of easing the stringency on by-product coke, as the furnace's normal requirements will be diverted to the production of foundry coke. This may enable con-



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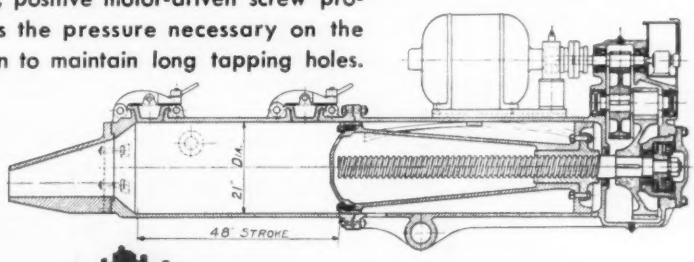

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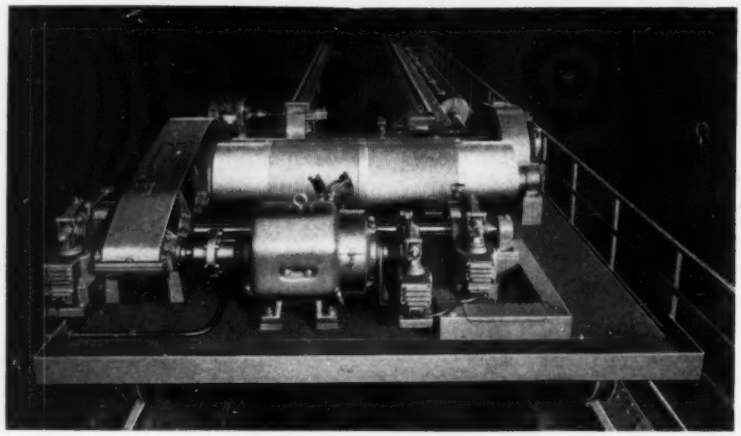

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sumers to lay in stocks for some weeks ahead.

The leading eastern producer has some furnaces down for repairs, which should be in blast shortly, provided the coal dispute is settled peacefully without giving rise to a strike. However, how much of this new production will be available for merchant consumption remains to be seen.

Chicago — Foundries are operating with low inventories of both pig iron and coke. For this reason, they are obliged to make their schedules conform to receipts of these raw materials. Iron producers and sellers are under constant pressure for speedier shipments and larger quotas. While a July coal mining stoppage looms as a threat to production of both pig iron and coke, belief is growing that the government will again forestall this, either by taking over the mines or obtaining a court injunction. Impact of the voluntary pig iron allocation program for housing cannot as yet be appraised because few foundries know enough about the program or how it will operate.

Buffalo — Although pig iron prices in this district remain unchanged, one of the leading merchant iron producers reports that an increase may be posted shortly. Meanwhile, sellers are protecting themselves by doing business on the basis of "price at time of shipment."

A tight supply situation prevails and eastern consumers' prospects for shipments by barge via the canal are dismal at this time. One producer has been discussing the possibility of moving iron down the canal next month, but pressure from local foundries for deliveries make it impossible to accumulate stock for barge loading. This producer also disliked the idea of keeping iron tied up on barges for two weeks while it is enroute when it is needed for immediate melt. There is little hope also that iron will be available for New England consumers.

Inadequate coke supplies and poor railroad cars are adding to producers' problems. Production is suffering as coke being brought in from outside sources to supplement insufficient local supplies is of poor quality. While shippers report an ample number of cars, inspectors refuse to pass them after they are loaded because of poor conditions.

Cleveland — Supply of merchant iron was bolstered with the blowing in last week of American Steel & Wire Co.'s "B" blast furnace here. The stack had been down since the first week of April for relining. It is one of the company's two furnaces here and has a daily rated output of 655 tons, 42 per cent of the company's Cleveland capacity. Pig iron prices in this district remain unchanged.

Cincinnati — Almost without exception the district foundries are scheduling two-weeks vacations. Nevertheless, none has asked deferred shipments on pig iron which has been going into the melt on a hand-to-mouth basis. Most melters are trying to maintain regular, if light, heats, to placate working forces. Shipments are being held close to the level established prior to the coal miners' strike.

St. Louis — This district's principal pig iron supplier is notifying customers their shipments will be cut

50 per cent beginning July 14 because of furnace relining. Missouri-Illinois Furnaces Inc., will cut off one of its two 500-ton furnaces on that date for about 75 days. Thereafter, output is expected to pick up sufficiently to give customers perhaps 10 per cent more iron than their former allocations. It will be the operator's first voluntary shutdown since May, 1945. Except for coal strike intermissions, it has operated at 100 per cent of capacity since July, 1946. Relining was timed as far as possible to coincide with vacation periods of customers. Some consumers already are directing shipments to be delayed for that reason. Company's coke ovens are back at 100 per cent operations. Coal reserves are fair but efforts to stockpile against a possible coal strike have been hampered by rail car shortages. Demand for iron remains extremely heavy, with special pressure noted when competing furnaces elsewhere are off for repairs. Consumers here have suffered little crippling hardship, though many still are using the maximum of cast scrap because of the tight iron situation.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 150

Pittsburgh — Threat of increased prices for coal and coke, developing out of the coal contract negotiations now under way, has resulted in increased pressure for coke deliveries. However, distribution of coke is under strict allocation so that efforts to obtain increased tonnages before indicated price advances generally have proved fruitless. Sellers have been accepting orders only on basis of price in effect at time of shipment to protect themselves against higher production costs. No improvement in the supply of either beehive foundry or oven foundry coke is indicated through this year. It is questionable whether coke or pig iron is in shorter supply at this time. Many foundries plan to shut down for a vacation period early in July, but there is little hope that coke inventories can be augmented during this period because of the scheduled coal miners' vacation.

Officials Arrange for Large Imports of Scrap

Washington — Announcement "in a matter of days" of an arrangement by which "very subtantial" of German steel scrap will be processed and shipped to the United States in the near future is due from the Commerce Department, according to government officials who have been working on this program for many months. Main details of the program have been determined and only legal formalities remain to be executed.

Alfred Hirsch, Pittsburgh scrap broker who recently was engaged as assistant to Alex Miller, chief, OIC Scrap Division, will go to Frankfort where he will act as liaison officer between the Office of Military Government, United States, and German scrap dealers to expedite the flow of scrap.

Hiram Winternitz Jr., president, Charles Dreifus Co., Philadelphia, will attend as a representative of the

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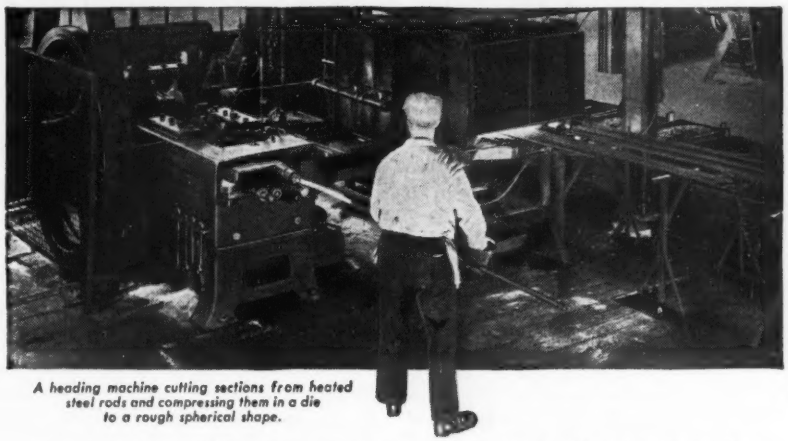

A heading machine cutting sections from heated steel rods and compressing them in a die to a rough spherical shape.

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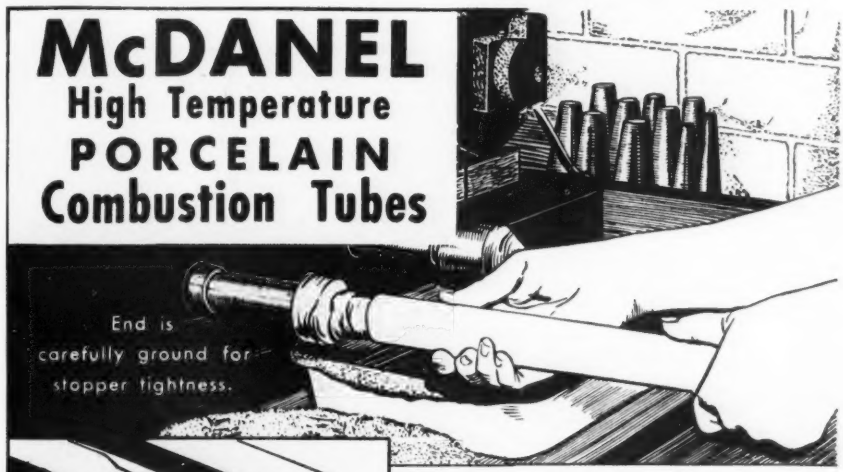

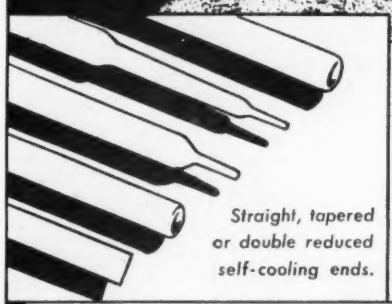

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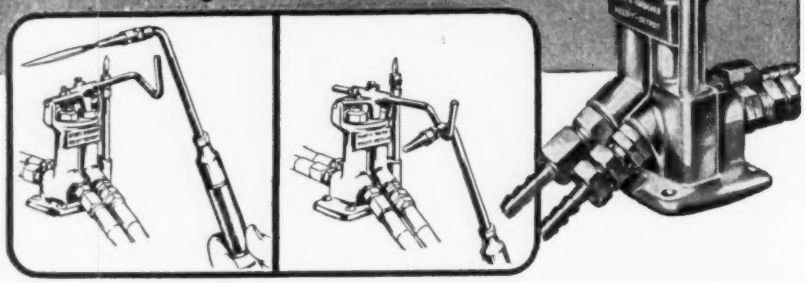

With Weldit Gasaver installed the operator simply hangs his torch on the handy lever rod of the Gasaver. The weight of the torch pulls the lever rod down, closing the valves of the Gasaver, thus shutting off both gas and oxygen intake lines. The usual idle flame and needless waste of oxygen and gas between operations is thus eliminated—no fire hazard or danger of injury to workers.

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State Department an international conference at Geneva, Switzerland this summer to study the scrap problem. Representatives of the United States and 16 European nations will consider the problem of distributing iron and steel scrap now available in Europe among various European countries and the United States in order to assist the European Recovery Program. It is estimated that Germany has between 3 to 10 million tons of scrap, the only large surplus in Europe. The upper limit of this range is believed to be the more nearly accurate. The steel industry here has been endeavoring to obtain a substantial portion of the scrap in the American zone in Germany in order to forestall a possible scrap shortage in this country next winter.

Scrap . . .

Scrap Prices, Page 154

Pittsburgh — No new mill scrap purchase of significant tonnage was recorded last week. The relatively small tonnage orders placed continued at formula prices. Mills are paying much closer attention to quality of incoming scrap shipments, as reflected in the increasing number of rejections. Scrap inventories have recorded little change in recent weeks despite absence of large tonnage purchasing. However, bulk of tonnage on old orders has now been shipped and some trade authorities predict mills will have to re-enter the market soon for larger tonnages if they expect to build up stock piles for the coming winter months.

Philadelphia — A strong undertone persists in scrap, particularly in the cast grades, with charging box and heavy breakable up $1 a ton to a spread of $62.50 to $63.50 delivered. This reflects in part the suddenly enforced suspension of operations at a blast furnace at Swedeland Pa., for a period of at least 60 days.

Prices are unchanged on major open-hearth grades of scrap machine shop turnings, mixed borings and turnings, and short shovel turnings. However, heavy turnings have advanced to a spread of $43.00 to $43.50 delivered; electric furnace bundles, to $44.00 to $44.50. Cut structurals are higher at $47.50 to $48 and punchings at $48.00 to $48.50.

New York — Brokers' buying prices for scrap are unchanged, although there is a stronger undertone in the steel grades. Both Pittsburgh and eastern Pennsylvania consumers are pressing for tonnage with supply not coming out as freely as a short while ago.

Chicago — Scrap is being consumed in heavy volume by district steel mills, but it is being received in substantial volume also. Some inventory is being laid down for future use, but the accumulation is far below what would be considered normal for this season. Demand for all grades of material is heavy and the market undertone is strong. Prices are essentially unchanged with No. 1 heavy melting steel holding at $39.50 a ton delivered, related grades according to the formula. Railroad grades still command premium prices in some offerings, although a substantial portion of railroad material is consigned to steel mills on formula price basis.

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HOTEL CLEVELAND

Cleveland, Ohio

Good grades of foundry scrap are in heavy demand, but the better grades are scarce.

Buffalo—Large quantities of scrap are moving from dealers' yards as mills stand ready to accept all available tonnage at formula prices. However, there is still some apprehension here over sales in the midstate area to outside buying sources. A second consumer from the Pittsburgh area entered the midstate field with bids $1.50 above the formula. Scrap from this outlying district normally moves into the Niagara frontier market.

While formula prices prevail on regular orders here, some weird price situations have arisen in reciprocal deals. In these deals, too, substantial tonnages are reported moving out of the area. Brokers are acting in deals which call for dealers moving scrap well below ceiling in order to get finished steel at the quoted price.

Cincinnati — Most district melters have fair stocks of scrap but some others appear in the market occasionally with desperation demands. Recently the volume coming into the market tended to decrease, a factor helping to maintain firm prices. Mills are accepting shipments regularly.

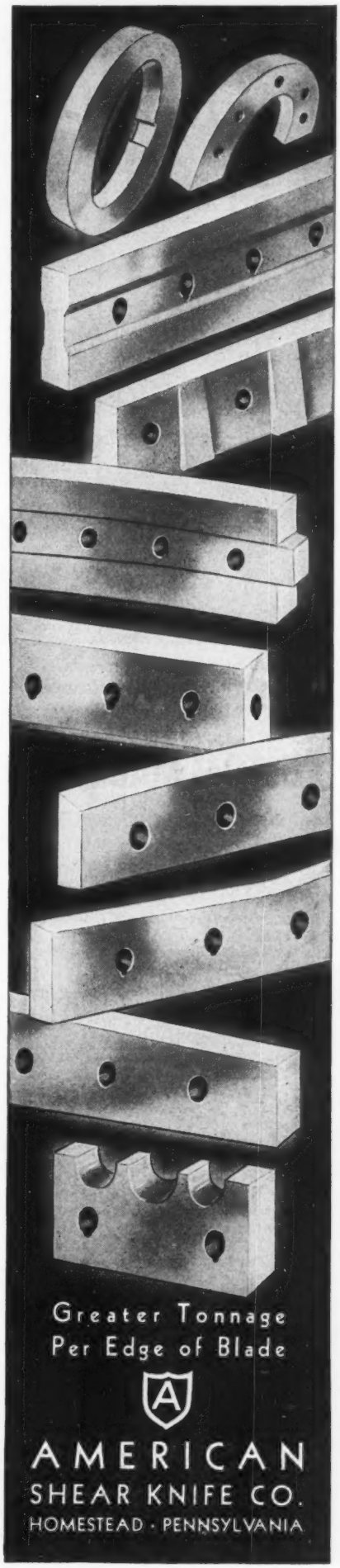
St. Louis — Despite declining scrap shipments due to the weather and farming activities, mill stockpiles have reached the highest point in many months. The largest consumer reports a 70-day supply on hand. Big consumers are all staying in the market, however. Some foresee a severe shortage this winter, and brokers concede it is likely foundry and mill operations will remain at the present high point. Formula prices are still being paid. For a time there was a slight upsurge in demand for cast scrap in anticipation of a coal strike, but those fears last week seemed to be waning. A Chicago melter, however, was reported to have offered $68 for cast, as against the $65 local going price, while an Ohio shopper was rumored to have gone as high as $73. A temporary dent in melting steel supplies is expected here after July 1 due to vacation shutdowns.

Seattle — The scrap market is firm, heavy melting steel bringing from $26 to $40, according to grade and quality; cast iron, ranging from $40 to $45. Competition of eastern buyers in thir area is less apparent, although offers are constantly being tendered. Scarcity of pig has accentuated the demand for cast iron. Mills report increased receipts of steel scrap, somewhat in excess of consumption. The flood disaster has cut off the Portland area temporarily, but a considerable accumulation is expected to come to local mills as soon as transportation facilities are restored.

Ferroalloys . . .

Ferroalloy Prices, Page 151

Philadelphia — Action by the Tennessee Product & Chemical Corp., Rockwood, Tenn., in advancing standard ferromanganese $5 a ton is understood to have been followed by Sloss-Sheffield Steel & Iron Co., Birmingham. Northern producers so far have taken no action. Advances in the South are effective at once on spot shipments; July 1 on contract tonnage.



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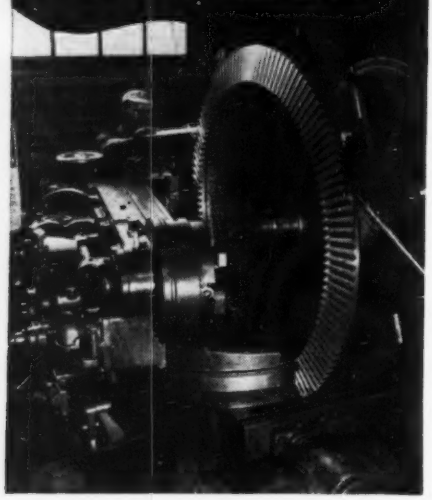

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Canadian Steel Price Advances Authorized

Toronto, Ont. — Wartime Prices and Trade Board has authorized price increases on a number of steel items in Canada. Officials point out that adjustments were necessary to reduce subsidies on semifinished steel and also because of higher costs of iron ore, coke and transportation.

Under the new ruling, authorization has been granted for increases of: Skelp, $12 per ton; carbon plates, $12 to $74 per ton; hot-rolled carbon bars, $5 to $70 per ton; wire rods, $5 to $65 a ton; hot and cold-rolled sheets, $7 per ton. Black sheets were marked up on 24 gage to $91; 10 gage to $73; galvanized 24 gage sheets to $115, and cold-drawing quality $107, and tin mill quality to $111 per net ton.

While the above list shows the Wartime Prices and Trade Board authorization for price increases, producers have not taken advantage of all items on the list. No advance in price has been announced so far by producers of hot-rolled steel sheets, although an increase can go into effect at any time. Price controls have been dropped from hot-rolled alloy steel, but no price revision has been made to this time.

Following are new increases and price per 100 pounds in the Toronto market:

	Increase	Price
Steel Plate	$0.60	$3.70
C. R. Strip	0.45	4.00
C. R. Sheets, 24 gage	0.45	5.35
H. R. Bars, base	0.25	3.50
Wire Rods	0.25	3.25

Pig iron prices have been moved up $4 per ton, and currently are quoted at, base grade (2.25 silicon and under), $43.50; malleable, $44; basic, $43.50, delivered per gross ton Toronto. Montreal prices are base grade $46; malleable, $46.50; basic, $46. For each 0.25 increase in silicon, prices advance 50 cents per ton.

Announcement also is made from Ottawa that the government has issued a new list of goods for which import permits will be required, effective June 26. These restrictions are another part of Canada's plan to save United States dollars. Permits will be issued only when goods are "essential to the national economy," Trade Minister C. D. Howe stated. Goods listed which were in "continuous and uninterrupted transit to Canada on or before June 25" will not require permits.

The list includes internal-combustion traction engines for other than farm purposes; all machinery composed of iron or steel, valued at more than $200 per unit; traction engines, air-cooled internal-combustion engines of not greater than 1½ horsepower rating; piston castings; aircraft and parts; electric dynamos or generators and transformers; electric motors, electric apparatus of a total invoice value of more than $25; goods of which iron or steel or both are the component materials of chief value, of a total invoice value of more than $200; electric or gas apparatus designed for welding or cutting, not including motors.

Bolts, Nuts . . .

Bolt, Nut, Rivet Prices, Page 149

Cleveland — Reduced allotments of steel bars and rods have cut rivet production, yet demand for rivets remains strong. With steel stocks exhausted one producer reported its operations are dependent on current receipts of steel, the consequence being a three or four-day work week. The Maritime Commission's tanker program which has begun to take rivets is expected to provide a steady demand for some time. Bulk of rivet business has been coming from the railroad freight car program. High construction costs have been preventing development of much rivet demand that ordinarily would come from building and bridge projects. Rivet prices remain unchanged.

Semifinished Steel . . .

Semifinished Prices, Page 148

Pittsburgh—Supply of unfinished steel remains considerably below needs of most nonintegrated steel producers. Considerable tonnage of semifinished was lost during the coal strike period and, although production schedules were quickly resumed following termination of the strike, most nonintegrated interests' inventories were sharply depleted. No easing in the critical shortage existing in semifinished steel is indicated for the rest of this year. Supply of forging billets, wire rods and sheet bars is inadequate to permit normal operations among nonintegrated steel producers. Some relief in semifinished steel supply occasionally develops from large tonnage foreign shipments to this country. One mill in France, for example, has offered over 32,000 tons of sheet bars in this country in an effort to obtain American dollars to finance its expansion program.

Manganese Ore . . .

Washington — Domestic production of manganese ore during the first quarter of 1948 continued at about the fourth quarter 1947 rate, but shipments to consumers, which are dependent upon Great Lakes shipping, declined sharply, according to the Bureau of Mines. Output of ore containing 35 per cent or more manganese during the first quarter amounted to 32,600 short ton, shipments were 16,400 tons and stocks of shipping-grade ore on hand at mines and mills at the end of the period totaled 23,000 tons. During the fourth quarter of 1947 production and shipments amounted to 33,200 and 28,400 tons.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

10,687 tons, transmission towers, spec. 2165, Arizona and Nevada, for U. S. Bureau of Reclamation, to American Bridge Co., Pittsburgh.

2200 tons, bakery, National Biscuit Co., Portland, Oreg., to Bethlehem Steel Co.

1840 tons, bridge, Delaware & Hudson, Wilkes

Barre, Pa., to American Bridge Co.

1400 tons, power plant addition, Standard Oil Co. of Indiana, Whiting, Ind., to American Bridge Co.; Stone & Webster Engineering Co., Boston, contractor-engineer.

1250 tons, two buildings, Solvay Process Division, Allied Chemical & Die Corp., Syracuse, N. Y., to Lehigh Structural Steel Co., Allentown, Pa.; one section is for the production of calcium chloride and will require 850 tons.

825 tons, apartment, Murray Hill Construction Co., East 36th St., New York, to Harris Structural Steel Co., that city.

800 tons, building, Kraft Foods Co., Hillside, N. J., through Daniel O. Evans, to Bethlehem Steel Co.

600 tons, telephone building, Hackensack, N. J., to Bethlehem Steel Co.

600 tons, plant building, Lever Bros., Edgewater, N. J., to American Bridge Co.; Stone & Webster Engineering Co., Boston, contractor-engineer.

530 tons, building, Alco-Gravure Division, Publication Corp., Hoboken, N. J., through Irons & Reynolds, to Bethlehem Steel Co.

400 tons, Armory telephone building, Paterson, N. J., to Bethlehem Steel Co.

300 tons, Neversink dam, Sullivan county, New York, to American Bridge Co.

250 tons, building, H. K. Ferguson Co., Helmetta, N. J., to Bethlehem Steel Co.

250 tons, coffer dam work, Connecticut, to unnamed fabricator.

230 tons, warehouse, David Smith Steel Co., Plainfield, N. J., to Bethlehem Steel Co.

220 tons, building, Borden Farm Products Co., New York, to Bethlehem Steel Co.

200 tons, warehouse, A & P Food Stores, Newark, N. J., through W. L. Blanchard, to Bethlehem Steel Co.

125 tons, state bridge, North Adams, Mass., to Bethlehem Steel Co.; W. W. Wyman, Pittsfield, Mass., general contractor.

Unstated, galvanized steel transmission towers to unstated interest by Bonneville Power Administration, Portland, Oreg.

STRUCTURAL STEEL PENDING

2040 tons, Washington state bridge, Wenatchee river; bids opened at Olympia, June 18.

1500 tons, Vine St. bridge, Philadelphia; readvertised, new bids July 2.

1000 tons, athletic pavillion, Corvallis, Oreg.; J. G. Watts Construction Co., Seattle, general contract awarded at $1,422,693.

650 tons, theology building, Boston University, Boston; Turner Construction Co., Boston, general contractor.

500 tons, senior high school, Ryan and Rowland Sts., Philadelphia, bids June 29.

400 tons, truss spans, state bridge, Mayfield-Northville, N. Y.; bids July 7, Albany.

350 tons, building, Behr-Manning div., Norton Co., Troy, N. Y.; Morton C. Tuttle Co., Boston, general contractor.

280 tons, truss and approach spans, state bridge, Elmdale-Gouverneur, N. Y; bids July 7, Albany.

150 tons, repairs, Lehigh Valley bridge, Rochester, N. Y.; bids June 22.

145 tons, I-beam spans, state bridge, Woodborne-Ellenville, N. Y.; bids July 7, Albany.

100 tons, three-span I-beam state bridge, South Berlin-Morris, N. Y.; bids July 7, Albany.

Unstated, six radial gates and lifts, canal headworks, South Coulee dam; Virginia Bridge Co., Roanoke, Va., low, $51,000.

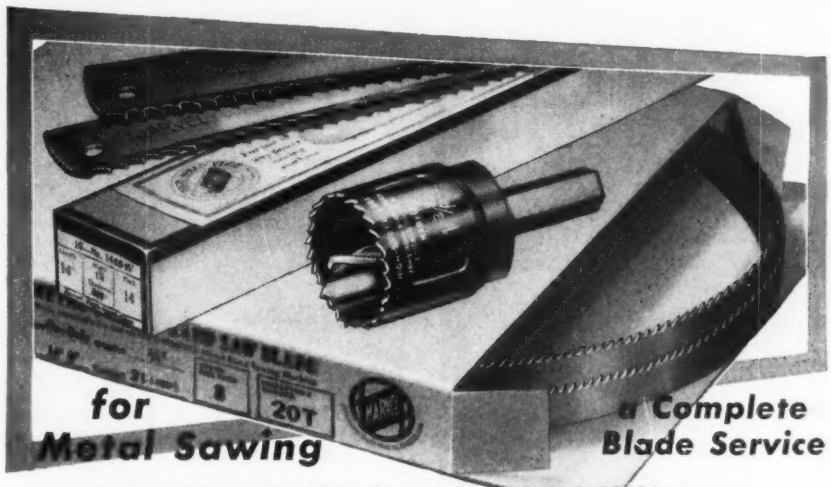
REINFORCING BARS . . .

REINFORCING BARS PLACED

250 tons, manufacturing building, Goodman Mfg. Co., Chicago, to Olney J. Dean Steel Co., Chicago; Sumner S. Sollitt & Co., Chicago, contractor.

REINFORCING BARS PENDING

1200 tons, approximately, senior high school,



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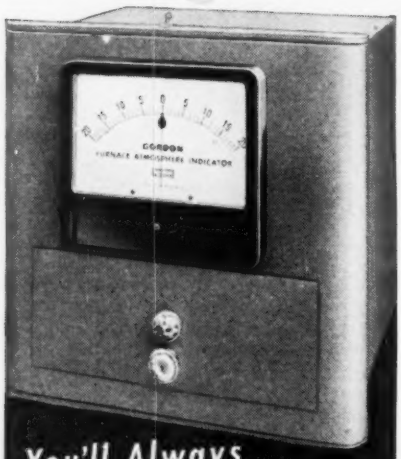

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Ryan and Rowland Sts., Philadelphia; bids June 29.

650 tons, athletic pavillion, Corvallis, Oreg.; J. G. Watts Construction Co., Seattle, awarded general contract $1,422,693.

500 tons, Washington state bridge, Wenatchee river; bids opened at Olympia, June 18.

Unstated, $500,000 administration building; bids to Board of Education, Seattle, July 7.

Unstated, county hospital, Tillamook, Oreg.; Ralph & Horowitz, Portland, low, $980,566.

Unstated, office building, Horder's Inc., Chicago; bids in.

PLATES . . .

PLATES PLACED

470 tons, gas holder, Kings County Lighting Co., Brooklyn, N. Y., to Bartlett Hayward Co., Baltimore.

230 tons, tanks, American Can Co., to Phillips Petroleum Co., New York.

PIPE . . .

CAST IRON PIPE PLACED

1280 tons, 6 to 12-inch, Metropolitan District Commission, Hartford, Conn., to United States Pipe & Foundry Co., Burlington, N. J.

475 tons, 8-inch, Springfield, Mass., to Warren Pipe Co., Everett, Mass.

300 tons, 6, 8 and 20-inch, Brookline, Mass., to United States Pipe & Foundry Co.

200 tons, 8 and 12-inch, New Britain, Conn., to United States Pipe & Foundry Co.

100 tons, Norwich, Conn., to United States Pipe & Foundry Co.

CAST IRON PIPE PENDING

1100 tons, 16-inch, Haverhill, Mass.; bids July 14.

870 tons, 36,500 feet various sizes bell and spigot; bids to Seattle, June 18.

Unstated 15,000 feet, 6 and 4 inch., or alternatives, to water district, Mukilteo, Wash., June 22.

Unstated, water system, state reformatory, Monroe, Wash., including steel water tank, etc.; Blake-Thompson Construction Co., Mt. Vernon, Wash., low $69,888.

RAILS, CARS . . .

LOCOMOTIVES PLACED

Chesapeake & Ohio, twenty-five 2-6-6-2 locomotives, to Baldwin Locomotive Works, Philadelphia.

Indian Government Railways, one hundred 4-6-2 steam locomotives, with 60 going to the Montreal Locomotive Works, Montreal, and 40 to the Canadian Locomotive Co.

Minneapolis, Northfield & Southern, five 2000-horsepower diesel-electric locomotives, to Baldwin Locomotive Works, Philadelphia.

LOCOMOTIVES PENDING

Southern Pacific, 95 diesel-electric locomotives, bids asked; list includes thirty 6000-horsepower freight locomotives and 65 switch engines ranging from 600 to 1500 horsepower

RAILROAD CARS PLACED

Norfolk & Western, 1000 seventy-ton all-steel hopper cars, to Virginia Bridge Co.

Seaboard Air Line, 500 fifty-ton box cars, to Pullman-Standard Car Mfg. Co.; 500 fifty-ton mill-type gondolas, to Pressed Steel Car Co.

Southern Pacific, 50 gondolas, 70-ton capacity, to Pressed Steel Car Co.

United States Navy, 250 tank cars, 50-ton, 10,000-gallon capacity, to General American Transportation Corp.

Western Maryland, 200 box, 50-ton capacity, to Pressed Steel Car Co.

RAILROAD CARS PENDING

Illinois Central, 3475 cars, including 3000 fifty-ton hopper cars, 375 fifty-ton flat cars, 100 seventy-ton hopper cars.

CONSTRUCTION AND ENTERPRISE

ALABAMA

BIRMINGHAM—Birmingham Gas Co. plans a $1,500,000 construction program.

ARKANSAS

NORTH LITTLE ROCK, ARK.—Arkansas Power & Light Co., Pine Bluff, will build an addition to its Lynch power plant here at a cost of $6,800,000.

CALIFORNIA

LOS ANGELES—Dulien Steel Products Co. plans to build a $50,000 warehouse on S. Alameda St.

VERNON, CALIF.—General Metals Corp. is building a new plant for production of malleable iron castings adjoining its present facility here. Mill will have a capacity of 400 to 500 tons of castings monthly. New equipment is also being installed, including a $100,000 electric annealing oven.

WARM SPRINGS, CALIF.—Laclede-Christy Clay Products Co., 391 Sutter St., San Francisco, has awarded a $500,000 contract to Larsen & Larsen, 629 Bryant St., San Francisco, for construction of a fire clay products plant here.

CONNECTICUT

MILFORD, CONN.—U. S. Electric Motor Co., Old Gate Lane, plans to build a 1-story monitor-type plant.

GEORGIA

ATLANTA—Grinnell Co., c/o W. H. Armstrong, engineer, 732 W. Peachtree St., will build a shop.

ATLANTA—Consolidated Realty Co., 32 Pryor St. N.E., will build an $86,000 warehouse and office at 730 Ponce de Leon Ave.

ATLANTA—Dol-Ray Corp., c/o contractor, has awarded a $150,000 contract to Henry C. Beck Co., 1 National Bank Bldg., for construction of a factory.

CARTERSVILLE, GA. — Nashville, Chattanooga & St. Louis Railway, 903 Broadway, Nashville, Tenn., has awarded a $1,500,000 contract to Oman Construction Co., Acklen Pike, Nashville, for a project to include railroad relocation and erection of one bridge.

HARTWELL, GA.—Textron Southern Inc., c/o contractor, has awarded a $3 million contract to Daniel Construction Co., Greenville, S. C., for erection of a boxloom rayon throwing and weaving plant.

NEWMAN, GA.—Richardson Co., c/o Arthur W. Krieg, architect, Box 82, Riverside, Ill., has awarded a $400,000 contract to Freevol, Smedburg Co., 5807 W. Chicago Ave., Chicago, for construction of a battery manufacturing plant.

SAVANNAH, GA. — Pittsburgh Plate Glass Co., c/o Levy & Kiley, architects, Realty Bldg., plans warehouse alterations.

KENTUCKY

GLO, KY.—Glogora Coal Co. plans to rebuild a burned tipple at a cost of $75,000.

MC ANDREWS, KY.—Eastern Coal Corp. plans to build a $150,000 coal tipple and chute.

MORGANFIELD, KY.—Ferrocraft Corp. will build a $100,000 plant for the manufacture of wire and metal novelties.

PADUCAH, KY.—Ray-O-Vac Co., Madison, Wis., plans to build a $75,000 plant here for the manufacture of dry cell batteries and other commodities.

LOUISIANA

ARABI, LA.—Gilcrease Oil Co., 106 W. Houston St., San Antonio, Tex., plans a $100,000 project to include skimming plant improvements and expansions.

NEW ORLEANS—International Harvester Co.

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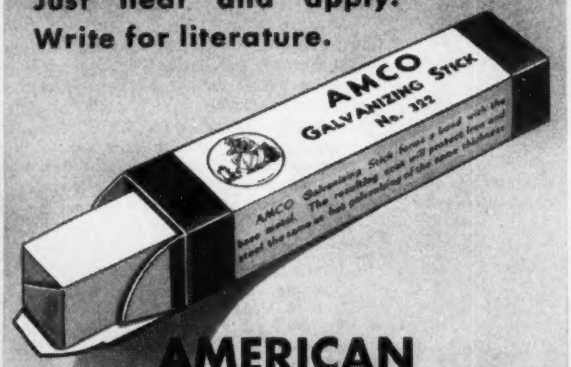

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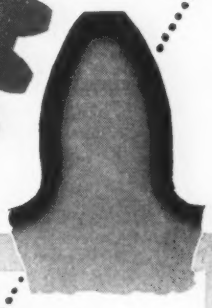

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contemplates construction of a twine mill on a 12-acre tract.

NEW ORLEANS—Creole Petroleum Corp., subsidiary of Esso Standard Oil Co., has awarded Avondale Marine Ways Inc. a contract to build two 65-foot work boats for use on Lake Maricaibo, Venezuela.

NEW ORLEANS—Avondale Marine Ways Inc. has been awarded a contract by Creole Petroleum Corp. for construction of three tugs to be used off the coast of Venezuela.

MARYLAND

BALTIMORE — Crown Central Petroleum Corp., American Bldg., will spend $113,000 for steel tanks, centrifugal pumps, a garage and firewall at 1620 S. Clinton St.

BALTIMORE—Bartgis Bros. Co., Ilchester, manufacturer of folding boxes, is spending about $500,000 for a new boiler plant.

BALTIMORE—Esso Standard Oil Co., Boston and Eaton Sts., has awarded a $100,000 contract for the erection of two high steel tanks and a concrete settling tank.

BALTIMORE—Phalanx Stainless Steel Inc., 1809 Lovegrove St., maker of wire products and stampings, has recently equipped 5000 sq ft of additional manufacturing space.

BALTIMORE—Baltimore Transfer Co., Monument and Guilford Sts., has awarded a $500,000 contract to Davis Construction Co., 320 W. 24th St., for erection of a terminal to include four units.

BALTIMORE—Continental Gage Corp., Standard Oil Bldg., has been organized to manufacture instruments and controls. Firm plans to lease and equip manufacturing space here.

BALTIMORE—Maryland Dry Dock Co., Fairfield, contemplates outlay of substantial capital expenditures for additional equipment and other improvements and also spending $8,800,000 for the acquisition of government-owned facilities installed during the war.

SPARROWS POINT, MD. — Signode Steel Strapping Co., J. W. Leslie, president, 2600 N. Western Ave., Chicago, has awarded a $1,500,000 contract to James Stewart & Co. Inc., 230 Park Ave., New York, for construction of a crane runway and factory on a 30-acre tract.

NEW JERSEY

PLAINFIELD, N. J.—Mack Trucks Inc., Empire State Bldg., New York, is erecting four buildings as additions to its existing engine manufacturing plant here. Project also includes alterations to present structures. New machinery will replace obsolete equipment.

OHIO

CARROLLTON, O.—Carroll Clay Co. plans construction of a new circular kiln which would increase production of refractories 50 per cent.

CINCINNATI—Hilton-Davis Chemical Co. reports work has been started by H. K. Ferguson Co., Cleveland, on a $900,000 expansion project, to include construction of a 2-story building.

CLEVELAND — Wellman Engineering Co., 7000 Central Ave., plans a $100,000 factory addition.

CLEVELAND—J. H. Holan Corp. plans to increase its production of truck bodies and equipment for the public utilities industry about 50 per cent with a plant addition at W. 150th St. and Lorain Ave.

CLEVELAND—Thompson Aircraft Products Co., 23555 Euclid Ave., is considering a plant expansion to provide manufacturing facilities for jet plane parts.

CLEVELAND—Brooks Oil Co. expects to complete a $75,000 expansion program by Aug. 1 which will double its manufacturing facilities at 3304 E. 87th St.

YOUNGSTOWN—United States Furnace Corp. is rebuilding its plant on Andrews Ave. at a cost of $50,000, and production is expected to begin within 30 days. Facility was severely damaged by fire earlier this year.

PENNSYLVANIA

CEMENTON, PA.—Frank Associates Inc. has awarded an $84,000 contract to H. E. Stoudt & Son Inc., 1212 Fifth St., Allentown, for construction of a mill addition.

ERIE, PA.—Erie City Iron Works will spend $60,000 for installation of crane guide-rails and elevation of the roof of part of the company's plant.

HANOVER, PA.—Hanover Wire Cloth Division, E. Middle St., has awarded a $75,000 contract to L. C. Hoffheins, 972 Carlisle St., for construction of a plant addition.

PHILADELPHIA—Superior Spring & Axle Works, 1631 Hunting Park Ave., plans to construct a $100,000 building.

PHILADELPHIA—Moore Products Co., H and Lycoming Sts., has awarded a $75,000 contract to Charles F. Rohleder, 600 Schuylkill Ave., for construction of a plant addition.

PRICES OF LEADING FERROALLOYS PRODUCTS

(Concluded from Page 151)

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Eastern Zone, contract, carload, bulk, 8.7c per lb of briquet, c.l. packaged 9.5c, ton lot 10.3c, less ton 11.2c; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.8c for c.l. and 2.5c for l.c.l. Freight allowed. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Eastern Zone, contract, c.l. bulk 8.75c per lb of briquet, c.l. packed 9.55c, ton lot 10.35c, less ton 11.25c; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.8c for c.l. and 2.5c for l.c.l. Freight allowed. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Eastern Zone, contract, carload, bulk 5.1c per lb of briquet, c.l. packed 5.25c, ton lot 6.7c, less ton 7.6c. **(Small size**—weighing approx. 2½ lb and containing exactly 1 lb of Si). Eastern Zone, carload, bulk 5.25c c.l. packed 6.05c, ton lots 6.85c, less ton 7.75c; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.45c for c.l. and 0.9c for l.c.l. Freight allowed. Add 0.25c for notching, small size only. Spot, add 0.25c.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18%, and Si 53-59%). Eastern Zone, contract, carload, lump, bulk 17.50c per lb of alloy, carload packed 19.0c, ton lot 19.8c, less ton 20.8c; Central, add 0.5c for c.l. and 0.85c for l.c.l.; Western, add 2.55c for c.l. and 2.6c for l.c.l. Freight allowed. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Eastern Zone, contract, carload, lump, bulk 16.25c per lb of alloy, carload packed 16.45c, ton lot 19.35c, less ton 20.85c; Central, add 0.5c for c.l. and 0.75c for l.c.l.; Western, add 2.55c for c.l. and 2.90c for l.c.l. Freight allowed. Spot, add 0.25c.

VANADIUM ALLOYS

Ferrovanadium: Open Hearth Grade (Va 50-55%, Si 8% max., C 3% max.). Eastern Zone, contract, any quantity, $2.90 per lb of contained Va; Central, add 2c for c.l. and 3c for l.c.l.; Western, add 6c for c.l. and 9c for l.c.l. Freight allowed. Spot, add 10c. **Special Grade** (Va 50-55%, Si 4% max., C 1% max.), $3. **High Speed Grade** (Va 50-55%, Si 1.50% max., C .20% max.), $3.10.

Vanadium Oxide: All Zones, contract, less carload lots, $1.20 per lb of contained V_2O_5. Spot, add 5c.

Grainal: Vanadium Grainal No. 1, 93c; No. 6, 63c; No. 79, 45c; all fob Bridgeville, Pa., usual freight allowance.

TITANIUM ALLOYS

Ferrotitanium: (Ti 20-25%, Al 3% max., Si 4% max., C 0.10% max.). Eastern Zone, contract, ton lot, 2" x D, $1.35 per lb of contained Ti, less ton $1.40. (Ti 40-45%, Al 7% max., Si 4% max., C 0.10% max.). Ton lot $1.23, less ton $1.25; Central, add 4c for 20-25% Ti grade, and 2.1c for 40-45% grade; Western, add 13.5c for 20-25% Ti grade, and 7.2c for 40-45% grade. Freight allowed. Spot, add 5c.

Ferrotitanium, High-Carbon: (15-20%). Contract basis, per net ton, fob Niagara Falls, N. Y., freight allowed to destination east of Mississippi river and north of Baltimore and St. Louis, 6.8% C, $142.50; 3-5% C, $157.50.

TUNGSTEN ALLOYS

Ferrotungsten: (W 70-80%). Eastern Zone, contract, 10,000 lb W or more, $2.25 per lb of contained W; 200 lb W to 10,000 lb W, $2.35; less than 2000 lb W, $2.47. Spot, add 2c.

Tungsten Powder: (W 98.8% min.). Eastern Zone, contract or spot, 1000 lb or more, $2.90 per lb of contained W; less than 1000 lb W, $3.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloys: (Zr 12-15%, Si 39-43%, Fe 40-45%, C 0.20% max.). Eastern Zone, contract, c.l., lump, bulk 6c per lb of alloy, c.l. packed 6.75c, ton lot 7.5c, less ton 8.35c; Central, add 0.25c for c.l. and 1.1c for l.c.l.; Western, add 0.6c for c.l. and 3.95c for l.c.l. Freight allowed. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max.). Eastern Zone, contract, carload, lump, packed 18.4c per lb of alloy, ton lot 19.15c, less ton 20.40c; Central, add 0.6c for c.l. and 1.05c for l.c.l.; Western add 3.05c for c.l. and 4c for l.c.l. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min., Si 1.50% max., Al 0.50% max., C 0.50% max.). Eastern Zone contract, 100 lb or more, 1" x D, $1.20 per lb of alloy, freight allowed. Less than 100 lb $1.30; Central, add 0.75c; Western add 2.9c, freight allowed. Spot, add 5c.

Borosil: (3 to 4% B, 40 to 45% Si), $6.25 per lb contained B, fob Philo, O., freight not exceeding St. Louis rate allowed.

Bortam (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 0.90 to 1.15%). Net ton to carload, 8c per lb, fob Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

OTHER FERROALLOYS

Ferrocolumbium: Cb 50-60%, Mn 5% max., Si 8% max., C 0.5% max.). Eastern Zone, contract, ton lot, 2" x D, $2.50 per lb of contained Cb, less ton $2.55; Central, add 1.65c; Western, add 6.45c. Freight allowed. Spot, add 10c.

CMSZ Mixes: (No. 4—Cr 45-49%, Mn 4-6%, Si 18-21%, Zr 1.25-1.75%, C 3-4.5%; No. 5—Cr 50-56%, Mn 4-6%, Si 13.50-16.0%, Zr 0.75-1.25%, C 3.50-5%). Eastern Zone, carload, 12 M x D, carload packed 17.25c per lb of material, ton lot 18.00c, less ton 19.25c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.3c for c.l., and 3.05c for l.c.l. Freight allowed.

Silcaz Alloy: (Si 35-40%, Ca 9-11%; Al 6-8%, Zr 3-5%, Ti 9-11%, Boron 0.55-0.75%). Eastern Zone, carload, packed, 1" x D, 39c per lb of alloy, ton lot 41c, less ton 43c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.3c for c.l. and 3.05c for l.c.l. Freight allowed.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx.). Eastern Zone, contract, carload, packed, ½" x 12 M, 15.0c per lb of alloy, ton lot 15.75c, less ton 17.0c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.3c for c.l. and 3.05c for l.c.l. Freight allowed. Spot, add 0.25c.

Simanal: (Approx. 20% each Si, Mn, Al). Packed, lump, carload 10c, ton lots 10.25c, smaller lots 10.75c per lb alloy; freight not exceeding St. Louis rate allowed.

Ferrophosphorus: (17-19% based on 18% P content with unitage of $3 for each 1% of P above or below the base) Gross tons per carload fob sellers' works, with freight equalized with Rockdale, Tenn.; contract price $58.50, spot $62.25.

Ferromolybdenum: (55-75%). Per lb, contained Mo, fob Langeloth and Washington, Pa., furnace, any quantity 95.00c.